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Volume 37

JUNE, 1954

Number 6

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Minnesota Medicine

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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Contents of MINNESOTA MEDICINE copyrighted by Minnesota State Medical Association, 1954

Entered at the Post Office in Saint Paul as second class matter. Accepted for mailing at the special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 13, 1918.

MINNESOTA MEDICINE

OFFICIAL JOURNAL OF THE MINNESOTA STATE MEDICAL ASSOCIATION
496 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota.

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Annual Subscription—\$3.00. Single Copies—\$0.40. Foreign and Canadian Subscriptions—\$3.50.

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Classified advertising—10 cents a word; minimum charge, \$2.00; key number, 25c additional. Remittance should accompany order. Display advertising rates on request.

Manuscripts should be addressed to: Arthur H. Wells, M.D., Editor, 519 East First Street, Duluth 5, Minnesota. Telephone 76636.

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Volume 37

June, 1954

Number 6

PROBLEMS AND OBLIGATIONS OF ORGANIZED MEDICINE

O. J. CAMPBELL, M.D.
Minneapolis, Minnesota

I HAVE BEEN asked to discuss some aspects of organized medicine, particularly its problems, its obligations and its relationship to teaching institutions. I suspect that I have been asked to do this because my background should enable me in some measure to bridge the gap in point of view between those in private practice and those who are full-time teachers. While this task has not been easy, I have found it a pleasure because it has offered an opportunity to express some deep convictions.

The future of medicine, I believe, is inseparably bound to a wise, healthy, farseeing, over-all organization which considers the rights and interests of all branches of medicine and which is at once receptive to change, resistant to exploitation, a stimulant to scientific progress and the better utilization of that progress, a monitor of the competency and behavior of its membership, a trusted and respected interpreter of medical thought to the public and all this for the betterment of medical care. The realization of this is a larger order which we have not yet fully achieved but it is a goal toward which we must direct our thoughts and energies.

I am sure that the great majority of us believes in a type of medical practice which is compatible with a free enterprise system. I am sure that the great majority is friendly to the American Medical Association which, as you know, is only the aggregate of all state associations which in turn are the aggregate of all county associations. Trained as you are to challenge existing practices and ideas in the hope of improving them, it would

not be unusual if a few entertained ideas which are quite at variance with the views of most of us. If there are such, they are considerate to the wishes of the majority and reasonable enough to know that were they in different positions, active practice for example, they might think differently.

I would like to express some of my own ideas concerning our problems and obligations as a medical organization, which ideas I have reason to believe are not too far removed from those held by the many able men who are giving their time, thought and energies to medicine's needs, who can visualize our goal, and who hold no illusions regarding the pitfalls and road blocks to be overcome.

Our most serious problem, and I should add "in my opinion," for I have rarely heard this thought expressed, is to resist the forces which threaten to divide us. Our recent struggle to escape compulsory health insurance, which was actually a closer call than many realize, indicates what the socializers would do to the practice of medicine were we to become split into factions.

Segmentation and division along lines of special interests assume a constantly increasing menace. Specialization in which whole groups with little knowledge of, or interest in, the problems of other groups fosters the illusion of self-sufficiency.

The general practitioners, who make up well over one-half of all practicing physicians and without whom we could not, for the foreseeable future, serve the American public, create a special problem. Today, the general practitioner feels threatened, suffers from loss of prestige and a sense of insecurity. Especially this is true in the cities where he is in competition with the specialist

Address delivered before the Faculty and Alumni Association, University of Minnesota, November, 1953.

and where everything he does is measured in terms of specialist performance. In rural areas, he fares better and in most cases measures up to the finest traditions of "the family doctor."

Today the general practitioner has his own organization and operates it from the praiseworthy standpoint of education of its membership and from the understandable viewpoint of self-protection. How tragic for medicine if the general practitioners and specialists would engage in a bitter competition for public favor!

There is urgent need today for organized medicine to summon all of its divergent elements and to define and spell out a reasonable relationship, especially between general practitioners and specialists.

To illustrate, the American College of Surgeons has declared it a breach of ethics for a surgeon to use a referring general practitioner as an assistant. Granting that on occasions such assistance may be but a subterfuge for a split fee and, granting that the general practitioner has no vested interest in his patient, he, nevertheless, often by being the family doctor, holds a trusteeship toward his patients' health, which would be poorly served were he forced off the case when surgery is involved. Most of us who are members and strong supporters of the College believe this to be wrong, believe it will discourage requests for consultation and reference of cases and will serve to isolate general practitioners into a resentful and dissident group.

The principle which I wish to emphasize is that questions as basic as that of ethics and that of all-important relationships is a matter to be settled by organized medicine as a whole and not by a special group, no matter how sincere the motives or how great the qualifications to advise.

Thinking further along this line, there is urgent need for organized medicine to gather its resources and courage and to clean up unwholesome and immoral practices within the confines of its own doors. It is, in my opinion, to our everlasting discredit that we did not stop rebates for optical goods and all other forms of rebates until forced to do so by governmental action.

The American College of Surgeons has undertaken a crusade against fee-splitting, ghost surgery, and excessive fees, all reprehensible practices which should have been eliminated long ago. It should not have been necessary for the college

to do this, and it is particularly unfortunate that they should have had so little confidence in the help that organized medicine would give them that they took their crusade out of medicine's lap and put it before the public. Again, most of us who will be glad to support any campaign to eradicate such practices, believe that the first step should have been to seek an agreement regarding a definition of fee splitting. All branches of medicine should have participated in reaching such an agreement. After full agreement, the whole-hearted co-operation of the American Medical Association should have been sought and should have been given.

Articles such as appeared in a recent issue of *Colliers* might not then be so disturbing to the public, so damaging to the confidence we seek to inspire, and so misleading about the extent of the evils described. The article did, indeed, admit that the majority of practitioners do not indulge in such misconduct, but it says so in fine print, figuratively speaking.

Closely allied to the eradication of gross and blatant evils is medicine's obligation to examine and to pass judgment upon the quality of service rendered by its members. Up to this time, it has been difficult if not impossible to do this. It has always been easier to avoid accepting a man into organized medicine if there is reason to doubt his worthiness than to extrude him after he has become a member. The courts have made it so difficult to discipline a member that his offense must be great before he can be expelled. Court action which is pending in Minnesota may be helpful in defining our rights in legal terms.

As many of you know, the Two Harbors Co-operative medical group is suing certain members of the St. Louis County Medical Society for the large sum of over \$300,000, claiming conspiracy. Out of this suit, it is to be hoped the rights of medicine will be so clearly established that we may be able to limit our organization to men who foster the type of medicine in which we believe and who maintain the highest ethical and scientific standards.

A study of the problem of monitoring the quality and excellence of practice of the individual member leads inevitably to the conclusion that the place to regulate is at the hospital-staff level. I believe that the recently promulgated rules applying to staff organization and staff obligations

which have been issued by the joint Accrediting Committee and which, as you know, require a critical review of every patient admitted to a hospital, clearly indicate such a viewpoint. These edicts are creating a furor, not only because of the added time and responsibility they demand, but more importantly because they require an adjustment in our thinking. Accustomed to freedom of thought and action in the practice of medicine, it is hard for us to accept the idea of supervision by our confreres. However, it is, in my opinion, an important move toward improvement of the quality of service which the public receives. With certain necessary modifications, some of the inconveniences may be eased. The hot breath of censure will most certainly put wings on the feet of the laggard and fear in the heart of the dishonest.

Organized medicine is very much opposed to federal aid to the medical schools. Perhaps some of you may not agree with this position, but you will respect the motives. We feel that support will eventually lead to control, and we believe it to be to the best interests of medicine and of the public to keep our medical schools free of governmental dictation or control of any kind or degree.

The American Medical Association, through a foundation established for the purpose, is attempting to raise substantial funds from its own membership to aid medical colleges. They have fostered other foundations and agencies also seeking funds for our schools. Admittedly, at this time, the moneys which have been raised fall short of the needs, but with more time the accomplishment will be greater. This country which raises so much money for privately endowed colleges will not desert its medical schools.

To stay strong, medicine must remain sensitive and responsive to public needs and demands. Never again will we withdraw from and neglect our public relations. Review but briefly our response to the public's reasonable demand: All over the country, implementing the request of the American Medical Association, county medical societies have established grievance committees to which any person who feels that he has been misused by a member of our profession may bring his complaint and receive satisfaction through explanation or redress.

We have made it possible for anyone to secure a physician within a reasonable time. Different

mechanisms operating in various ways are employed over the whole country to assure availability of medical care to the public.

We have recognized the public's complaint of high costs of medical care; and have fostered and promoted the sale of voluntary prepayment forms of insurance, such as the Blue Shield plans, and also the direct and indirect encouragement of the sale of commercial contracts covering surgical and medical expenses.

Today, according to testimony of major insurance companies at hearings before a House Committee, 91,000,000 men, women, and children are covered by hospital insurance, 73,000,000 have surgical-expense coverage; and 36,000,000 are protected against medical expense.

Policies covering catastrophic illness are making their appearance. Two years ago California initiated this in conjunction with their standard Blue Shield policies; others, including private insurance companies, are following. Edmund B. Whittaker, vice-president of Prudential Insurance Company, estimates that already one million people are covered by this form of policy.

The voluntary insurance method of attacking the problem of high costs will never satisfy those who believe that people have a divine right to good health without personal responsibilities for it. It is their contention that under a voluntary prepayment insurance system, man cannot afford his medical care along with food, clothing, shelter and recreation. They completely abandon the spirit of independence, self reliance and free enterprise in favor of governmental paternalism, socialism or some of the other "isms."

Furthermore, I believe that, to earn the respect to which it is entitled, organized medicine has the duty of fostering within its membership a stronger sense of obligation toward citizenship and toward civic responsibility. Perhaps it is because our old tradition taught us to be self-effacing as far as the public is concerned that doctors feel detached from civic activities. Regardless of the cause, it is harmful to us to shirk either the financial demands of our communities or the demands they may make upon our time and energies. When other groups are doing a good job, can we afford to do otherwise?

In the minds of many, medicine should shun politics. What is politics but the business of operating our civilization? We can no more

shun politics than we can waste our vote by boycotting the polls.

In this phase, I have followed a rather philosophical, and, some may believe, unrealistic approach. I am quite ready to admit that organized medicine has made many mistakes and will unfortunately make more. I would not have you believe that I consider our need for unity transcends the right of any individual or any group to disagree, to debate and to dissent. You have only to attend a meeting of the House of Delegates to hear very vocal dissension. I ask only that these differences and debates be held within our own portals, and that when the vote is cast the will of the majority shall not only prevail but be freely adopted.

I wish to reiterate my belief that medicine shares in the unrest and the uncertainty afflicting this country and the entire world, that medicine as we would have it is still in danger and that, just as the free world needs a strong America, so free medicine needs a strong American Medical Association.

I would rather skip the next phase but to do so would be to shun an obligation to help smooth out a totally unnecessary feeling of unfriendliness which seems to have crept between our medical school and some of the doctors in our state. It is hard to evaluate this feeling, its origin, its extent or its intensity, but perhaps it is only necessary to know that it exists in order to move to correct it.

Last year, Dr. Charles Sheppard of Hutchinson, speaker of the House of Delegates of the Minnesota State Medical Association, ably represented the point of view of the rural general practitioner and the views he expressed must be considered as held by many of the men in rural practice. The faculty may believe that many of the direct and implied criticisms were unjust, some of the suggestions impractical or outweighed by other considerations. Nevertheless, right or wrong, just or unjust, it was good that he expressed his views.

I am somewhat mollified to think that at the state level our relationship with organized medicine has been excellent. Has not Dr. H. S. Diehl been a faithful attendant at council meetings, given hours of study on important committee assignments and has he not done as much or more on a National level? As a matter of fact, many of our members, including some heads of departments,

have worked for organized medicine: Drs. Howard, Spink, Keys, Bieter, Wangenstein, McQuarrie, to mention only a few of them.

Finally, I reflect on the fact that our school cannot grow greater in an atmosphere of professional suspicion and disapproval. Especially this is true when the financial support comes for the most part from taxes appropriated by the state legislature, and our clinical material from the bailiwicks of both friends and critics. I now, therefore, try to evaluate what part of our critics' complaints is valid and how much of it is based on misinformation or misunderstanding.

Let me revert to my role as friendly critic and advisor and attempt to assay the situation in the hope that there may be an easy correction to whatever valid basis of ill feeling may be found to exist.

I believe that the medical school may feel most secure in its relations with the specialists in Minnesota. Within this group criticism and ill feeling are least likely to exist; rather the faculty is held in highest esteem and is called upon frequently for consultation and advice.

Within the Twin Cities, however, there is a tiny fear, a smoldering apprehension, that in years to come, with its source of teaching material from rural areas drying up, a gradual emphasis in private practice among the faculty will result in a large private clinic maintained by taxes and in competition with the private physician.

Let me hasten to add that I am not aware of antagonism to private practice on the part of full-time men when done on a limited basis. The doctors, proud of and ambitious for their medical school, know that we cannot keep good men as heads of departments if they are limited to the same remuneration as a professor of Romance Languages. It is true that those of us who lose private patients to the University actually contribute more to the support of the medical school than do laymen who merely pay taxes. We do not object to the situation as it now exists, but would certainly not willingly accept the presence of a large private clinic. But why worry about something that does not exist?

There is far less ill-feeling among general practitioners in cities than in urban areas. In the matter of sampling, I have found very little antagonism. A general practitioner friend of mine who is very active in the Academy of General

Practice in Hennepin County told me only a week ago that since Dr. Howard had assumed his position, relations between the general practitioner of his area and the medical school had improved greatly.

We come finally to the rural general practitioner, where our real problems lie. These men have been for years feeders of the University Hospital. These are the men who have been most seriously handicapped and frustrated by failure to obtain assistants and replacements in their areas. These men also are allergic to the attractions of specialization for the younger men. Happy in their work and in their positions in their communities, they cannot understand why new graduates in medicine should hesitate to enter general practice in the "country." To add to their frustration, they cannot obtain nurses or even the right to train the nurses needed to operate at their hospitals. This may explain why at times they may appear unreasonable.

I am convinced that our medical faculty does nothing deliberately to discourage our graduates from becoming general practitioners. Our offense, if there is an offense, is one of omission and not commission. In other words, the only question is as to whether we as a faculty are doing all we can to encourage graduates up to the point where the needs of the state are met. After that we have no obligation to influence. Some of us may feel we have no right to attempt to influence.

I believe that we can obtain enough information pertaining to student motivation to clear us of any suspicion of influencing the student toward specialization. I believe also that such information should be gathered, analyzed, and transmitted to the medical profession of the state. For the sake of harmony, we should defend ourselves vigorously in this respect.

I do not believe that medicine would want its medical schools staffed exclusively by teachers whose sole aim and qualification is to turn out good practitioners of medicine. It is good that some teachers find their greatest satisfaction in the superb training of men who are thereby made capable of supplanting or excelling them and that through this and through research they make their greatest contributions to medicine and mankind. We ask only that they not neglect the requirements of providing the needed practicing physi-

cians for the people whose taxes support our school.

We come now to what I consider the only justification for the resentful attitude of these men. Over a period of years in which they have been sending their low income or indigent patients to the University Hospital, a number of irritating incidents have occurred either to them individually or to a confrere whose experience they embrace as their own. A report is not received. It is very tardy. It is sketchy. It is enormously detailed but not summarized. A patient referred to the hospital is sent back without treatment and without explanation. The patient hears or thinks he has heard remarks criticizing the referring doctor. These and a host of other complaints are offered by the rural doctor to explain his reluctance to send his patient to the University Hospital. Add to this the fact that local commissioners charged with the financial responsibilities of the patient's care have found that it is less expensive to use the new hospital in the community than to use the University Hospital, and the patient would rather stay home within easy reach of his family. You will then understand why clinical material is becoming harder to get.

May I offer a suggestion? Complaints on the part of referring doctors are far less common when the patient is a private patient referred to a specific member of the staff. This is because the staff man immediately establishes a consultant relationship with the referring doctor.

Why not the same attitude toward every patient and every referring doctor? Let the code of ethics of the American Medical Association pertaining to consultations and referrals apply in these cases insofar as it is possible to apply it. This simple adjustment in thinking and the mechanics to operate it are in my opinion all that is needed to start our hospital and staff toward a fine relationship with the doctors of the state who will then see that the medical school does not suffer for want of clinical material.

One other suggestion which I have already made to Dr. Diehl: the University Hospital and the Medical School should have a professional relations man, who will visit the county medical societies, and even the doctors' offices to acquaint the

(Continued on Page 414)

NEUROGENETIC INHIBITORS FOR FUNCTIONAL DISORDERS

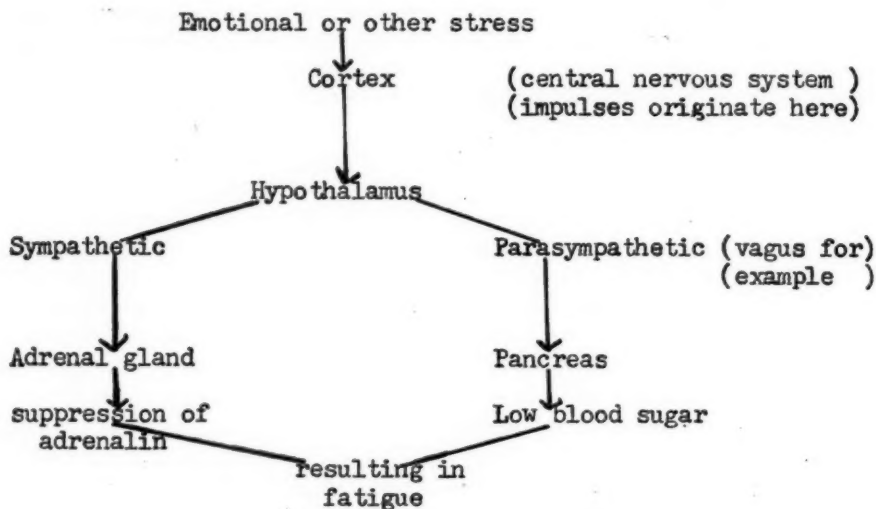
NORMAN E. RUD, M.D.
Minneapolis, Minnesota

WHETHER or not an illness is purely a functional disturbance or an organic lesion, the disease pattern is always modified by emotional factors. Evidence today points out that the autonomic nervous system is the main link in transforming emotional stimuli into somatic responses. Corroborative evidence is provided by the fact that the influence of emotional stress is particularly marked where a disease mainly affects functions under autonomic control, and by the fact that great benefit results from treatment with drugs acting on the autonomic nervous system.

pulses will produce a variation in organ function. These changes are manifested by such symptoms as sweating, palpitation, diarrhea, constipation, etcetera.

Treatment

It is often difficult to pin-point the exact nature of functional gastrointestinal symptoms or that of any functional ill for that matter. Oftentimes, a particular individual who has worked himself into a key job in a large organization and who may be under constant tension and pressure develops symptoms of gastrointestinal distress be-



Basis of Therapy

In view of our experience with a large number of patients presenting functional ills, we agree with the present-day theory that autonomic imbalance is largely responsible for the development of such conditions. The following diagram explains briefly how the various nerve pathways play a mechanistic role in the development of such symptoms.

The above sketch shows the result of emotional impulses on two particular organs leading to the symptom—fatigue. It must be pointed out that every organ is innervated by these pathways and that any change in the number of nerve im-

pulse cause economically he knows he cannot quit his job for which he has worked so hard and long, and yet truthfully realizes his inadequacies (Case 2). Medication in this type of individual is difficult. One cannot rightfully employ large doses of barbiturates because, actually, this will not cure him and, in addition, will produce drowsiness and slowing of his thinking which will make the handling of his tasks even more difficult.

Most physicians realize that one cannot state a fast and hard rule which will cover medications for every patient. It is necessary to remember that every patient is an individual and that for every individual a specific regime should be or-

ganized which will be most effective for him. For example, in a proven case of duodenal ulcer (in which tension state is present), immediate relief is not always obtained with such standard accepted anticholinergic drugs (Banthine®, Pro-Banthine®, Prantal®, Antrenyl®), in addition to antacids and a proper diet. We have found that the addition of a complete autonomic stabilizer (1 tablet b.i.d., or t.i.d) may often be sufficient to make therapy successful. When gastrointestinal disease exists in older individuals—during the climacteric phase—one may often find that the addition of estrogens or androgens may be desired in order to convert ineffective therapy into beneficial therapy. One must be careful, however, not to employ drugs which may be contraindicated or harmful.

From the above diagram, one quickly sees that if the excessive impulses set forth by the central nervous system, and both the sympathetic and parasympathetic activity can be reduced, autonomic imbalance can thus be restored and symptomatic relief eventually achieved. Basic pharmacologic studies by Rothlin⁸ demonstrated that drugs inhibiting either the parasympathetic or sympathetic nervous system could be given together without balancing out their effect. In other words, ergotamine tartrate continued to inhibit sympathetic impulses, and belladonna alkaloids continued to inhibit parasympathetic impulses even though administered together. Addition of phenobarbital did not diminish activity of any of the three drugs. Administration of this combination restores autonomic balance because it acts on all three nervous pathways involved in the development of functional symptoms. Karnosh and Zucker² have previously suggested that "probably the best medication for all neurovegetative disorders is a combination of bellafoline (vagal sedative), ergotamine tartrate (sympathetic sedative), and phenobarbital (cerebral sedative)." Recent papers^{1,3,4,6} indicate the therapeutic trend toward the control of such conditions by means of controlling autonomic activity.

Case Histories

The following case histories demonstrate our results with this agent.*

Case 1.—W. S., a white, forty-seven-year-old milkman, presented himself with a typical history of duode-

*Bellergal (Sandoz).

nal ulcer of six weeks' duration. He complained of severe epigastric pain, relieved by food, but which developed two to three hours after eating. He had severe heartburn and spasm. There was no history of previous illness, but the patient had been operated on several years before for an inflamed appendix. Family and marital history were negative.

Physical examination revealed no abnormalities. The man was of normal weight for his height. Upon palpitation the epigastric area was found to be tender. A laboratory examination was completely negative. This included a complete blood chemistry, sedimentation rate, etc. The x-ray studies revealed a typical, small but active duodenal ulcer.

He was placed on a typical ulcer regime, starting out with milk for a few days and gradually increasing non-acid forming foods. He was given antacids and anticholinergic agents. At the same time he went on vacation in order to completely follow the regime and get needed rest.

He returned after one week on the ulcer regime with very little improvement in his symptoms. The pain was as severe as previously. Interestingly enough he complained of severe fatigue and lassitude, although he was not working, and was supposedly on a restful vacation. The above regime was continued but in addition he was prescribed one tablet t.i.d.-a.c., of Bellergal (complete autonomic stabilizer), and one b.i.d.-a.c., of therapeutic B-Complex capsules. He was seen three days later and appeared completely relieved of all symptoms. He stated he no longer felt so tired and was able to enjoy his vacation, and was completely free of his gastric symptoms. He has been on this regime for over a year with no further complaints. X-ray studies show healing of the ulcer crater.

The above case history shows the effectiveness of the addition of a complete neurovegetative sedative in the treatment of duodenal ulcer. This organic lesion often has with it an emotional overlay which may prevent prompt healing. The symptom of fatigue is typical of a functional disorder and as previously discussed will only improve with restoration of autonomic balance.

Case 2.—This thirty-seven-year-old male executive who presented a history of severe atypical pain in the epigastrium region and left upper quadrant of the abdomen, of one and one-half years' duration. This individual assumed a great deal of responsibility in his executive capacity and he took his position and work most seriously. He attained this position at a young age which resulted in a feeling of insecurity for fear that he was unable to live up to the demands made on him.

He apparently had no family or marital problems and had had no history of previous illness. The physical examination was negative except that on palpitation there was tenderness in the epigastrium and upper left

quadrant. Laboratory examination was entirely negative. Two complete sets of gastrointestinal series were made, as well as one gall-bladder x-ray study. All three of these were negative except that they revealed a spastic colon. This finding is entirely in keeping with the history of nervousness and feeling of insecurity due to his position. He was placed on a bland roughage diet and prescribed anticholinergic agent and sedatives (barbiturates), with no relief.

After several trials with a variety of drugs he was finally placed on one tablet t.i.d.-a.c. of Bellergal and 0.5 grams of Mephenesin t.i.d. He was seen two weeks later and had shown much improvement. The Bellergal was reduced to one tablet a.c. and 0.5 grams of Mephenesin b.i.d. He has been on this dosage for six months and has been completely relieved of his gastric pain and distress.

This case history is a typical example of a functional disorder. It is easier to diagnose, for the simple reason that the emotional cause of the symptoms are obvious upon discussion. There are two problems with such a patient, for besides being able to control the symptomatology, one must also help him to adjust to his environmental stresses. As previously discussed, the proper use of a complete autonomic sedative aids in producing symptomatic relief. By stopping the pains the patient naturally feels better and can begin to learn to adjust himself emotionally. In this particular instance the cause of his problems were discussed with him and after several sessions, he began to understand how his symptoms resulted from the stresses under which he was living. He was advised to try and get more relaxation, particularly out-door exercise, and to try and develop some interesting hobby in order to have

something, other than his work, on his mind. Many of these executives fail to "leave their work in the office," and must be educated not to take it home with them. Under a modified regime this patient has continued to show marked improvement.

Conclusions

We have presented two examples of case histories which demonstrate a method of treating gastrointestinal disease of a functional or organic nature, or, in which a combination exists. We recommend a drug which contains sympathetic, parasympathetic and central inhibitors, for this particular combination appears to work more rapidly and appears to necessitate smaller doses than any drug previously used. Other adjuncts such as Mephenesin or hormones are employed as indicated. The emotional aspect of these conditions must be considered and adequate psychotherapy instituted in order to help the patient readjust himself to his environmental stresses.

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PROBLEMS AND OBLIGATIONS OF ORGANIZED MEDICINE

(Continued from Page 411)

doctors with University problems and in turn to learn the doctors' problems and what the staff can do to help them.

It has been my very great pleasure and privilege to try to serve both organized medicine and the medical school of this state. I have tried to

interpret to each the attitude of the other. There is no incompatibility. There is no clash of interests. There should be no friction.

I am sure that the physicians of this state are very proud of their school and wish to see it continue to climb in stature and recognition.

CHANGES IN BONE AFTER EXPOSURE TO ULTRASONIC ENERGY

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INTEREST in the medical application of ultrasonic energy gained initial momentum in Germany, in 1932.³ Since then, many widely varying conditions have been considered to be indications for ultrasonic therapy. In an effort to establish a basis for the clinical application of ultrasound, workers at this institution have studied various experimental aspects of this problem during the past six years. The outstanding conclusion to date is that no other known agent can heat bone selectively in so effective a fashion.^{1,4}

Ultrasonic waves are those in the acoustic spectrum that are beyond the range of the human ear. The Standards Committee on Electroacoustics has set the lower limit of ultrasonic frequency at about 15 kilocycles per second.⁵ The frequencies used most commonly in treatment are 800 and 1,000 kilocycles per second. The respective wave lengths in muscle at these two frequencies are 1.92 and 1.54 mm.

Histologic studies have revealed the production of osteogenesis in the bones of normal dogs after exposure to certain amounts of ultrasonic energy.² Subsequently, it was considered advisable to test the reproducibility of this phenomenon. We also wished to study the animals for a longer period than the twenty-one weeks used in previous studies and to add roentgenologic evaluation of any changes. This paper is a preliminary report of the study just suggested.

Equipment and Methods

The equipment necessary for production of ultrasonic energy includes a radio-frequency oscillator that generates alternating current of the de-

sired frequency. This current is transmitted through a long coaxial cable to the sound head, or transducer. The long cable permits freedom of motion of the sound head, which is essential for clinical use. Housed in the sound head is a quartz crystal that has been cut so that its natural vibratory frequency coincides with the frequency produced by the particular generator associated with it. This crystal has piezoelectric properties that cause it to change dimensions when an alternating electric current is applied to it. These changes, occurring with high-frequency alternating current, result in vibrations of the crystal of the same high frequency. This is the source of the ultrasonic waves.

Ultrasonic power can be regulated through the generator, and can be measured by means of a power meter calibrated to read in watts representing the total output of the radiating surface.

In most of our work we used the Siemens Sonostat generator, which had a frequency of 800 kilocycles per second; the attached sound head had a radiating surface of 10 sq. cm. We also used the Ultrasonor generator, a product of the Ultrasonic Medical Equipment Corporation. This generator produced a frequency of 1,000 kilocycles per second and had a sound head with a radiating surface of 5 sq. cm.

During exposure to ultrasonic energy, the animals were anesthetized by intravenous injection of 25 mg. of pentobarbital sodium per kilogram of body weight.

Both femora of a series of sixteen dogs were exposed through the lateral aspect of the thigh; a stationary technique was used. Either 15 watts of power with a frequency of 1,000 kilocycles per second or 20 watts with a frequency of 800 kilocycles per second was applied for three periods of five minutes each, with a five-minute interval for cooling between exposures. In four of these animals, a needle thermocouple was inserted into the thigh so that its tip (the site of one thermojunction) was directly over the middle of the femoral shaft. The position of the sound head

Read at the Surgical Forum of the American College of Surgeons, Chicago, Illinois, October 5-9, 1953.

Abridgement of thesis submitted by Dr. Ardan to the Faculty of the Graduate School of the University of Minnesota in partial fulfillment of the requirements for the degree of Master of Science in Orthopedic Surgery.

The Mayo Foundation is a part of the Graduate School of the University of Minnesota.

Dr. Ardan is a Fellow in Orthopedic Surgery at the Mayo Foundation; Dr. Janes is in the Section of Orthopedic Surgery, and Dr. Herrick is from the Biophysics section of the Mayo Clinic.

that gave the most rapid heating of the thermocouple was determined, and the sound head was clamped in this position. The maximal increase of local temperature reached in these four dogs

The remaining twelve dogs were exposed blindly by attempts to aim the field of sound at the middle of the femoral shaft at a given distance above the lateral femoral condyle.

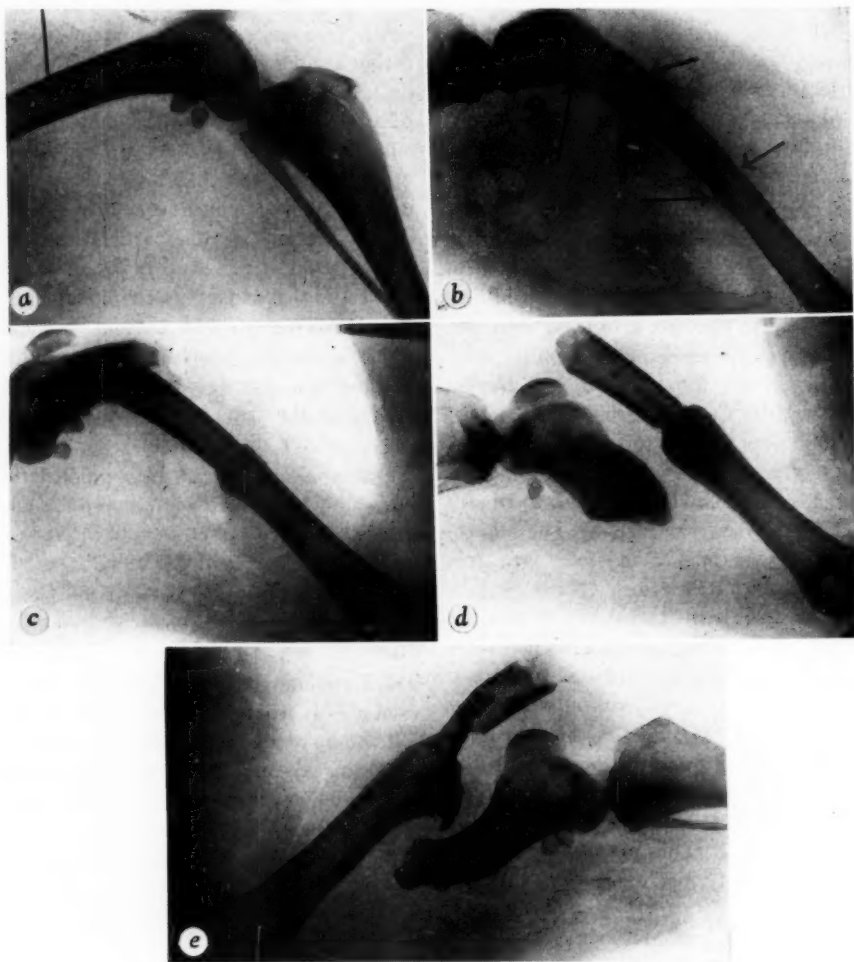


Fig. 1. (a.) Femur of dog prior to exposure to ultrasound. Needle thermocouple in position. (b.) Same femur ten days after three exposures to 20 watts of ultrasonic power for five minutes. Early periosteal reaction is seen at each end of a segment of bone thought to be necrotic. The field of sound struck the center of this segment. Areas of liquefied fat are seen. (c.) Same femur two weeks after application of ultrasound. Note progression of periosteal reactions, the appearance of rarefied bands at each end of the necrotic segment and the fracture through the distal rarefied band. (d.) Same femur one month after exposure. Note complete displacement of fractured fragments and no evidence of healing. (e.) Same femur five months after exposure. Note resorption of periosteal reactions and necrotic segment. Little effort at healing is present.

during single exposures ranged from 11.35° to more than 33.55° C. During several exposures the calibrated scale of the meter was exceeded.

A coupling medium of mineral oil was used to eliminate any air, which prevents the transmission of ultrasonic energy.

Results

We have evaluated results of a twelve-month roentgenologic and a three-month histologic follow-up in these animals.

Clinically, all animals exposed showed a limp in one or both hind legs for twelve to twenty-four hours after exposure. Other than this, only three dogs showed any early adverse reactions; these were all from the group of four in which the sound had been guided by the thermocouples. In these dogs, small, slowly healing, third-degree burns appeared in the skin of the medial aspect of the thigh directly opposite the sound head, that is, at the point of exit of the ultrasonic energy. In addition, massive edema and apparent paralysis of both hind legs developed in one of these dogs on the fifth day after exposure. This edema and paralysis subsided during a period of fourteen days.

However, other changes were noted in the interim. Figure 1 shows these changes through the stages of periosteal reaction, sequestration, complete dissociation of the fractured fragments with nonunion and, finally, progressive resorption of the initial periosteal reaction and of the necrotic segment of bone. The rarefactions in soft tissue seen in these roentgenograms were interpreted to represent liquefied fat resulting from the intense heat produced during exposure to ultrasound. These changes disappeared in about three weeks. It should be noted that no other dog exposed in this or in any other series in which we have had roentgenologic controls has shown these changes in the soft tissue.

The roentgenologic follow-up demonstrated that of the thirty-two femora exposed, eleven appeared to be completely normal, and thirteen showed minimal evidence of mottled densities with occasional erosions of the cortex. The remaining eight femora showed changes similar to but, for the most part, less extensive than those just illustrated.

All of the twenty-two femora obtained from study of the first eleven dogs showed some gross changes at the site of ultrasonic incidence. Those animals in which x-ray evidence of periosteal reaction had been present showed such reaction grossly (Fig. 2a), along with zones of eburation and zones of pink or brownish discoloration. These discolorations and the eburation also were appar-

ent in all eleven of those femora which had appeared normal roentgenologically (Fig. 2b). We have not made extensive microscopic studies of these latter changes as yet, but the importance of



Fig. 2 (a). Femur removed from a dog three months after three exposures to 20 watts of ultrasonic power for five minutes. Note periosteal reactions, with segment of bone between. (b) Anterior aspects of femora removed from a dog six months after three exposures to 20 watts of ultrasonic power for five minutes. Note brown discoloration in the region of ultrasonic incidence and the targetlike zone of eburnated bone near the center of these discolorations.

this finding lies in the evaluation of reports of ultrasonic treatment in which the claim that no changes in bone were produced is based on the normal appearance of roentgenograms.

We have surveyed microscopic sections from three femora which exhibited changes similar to those seen in Figure 1. An entire cross section through one of the zones of periosteal reaction is shown in Figure 3a for purposes of orientation. The light area at the right end of this section represents a mass of cartilaginous cells undergoing endochondral formation of bone. The slightly darker mass near the left end of the section represents the original medullary cavity that has become filled with dense fibrous tissue. Around this mass can be made out the remains of the original cortex, which has become necrotic and

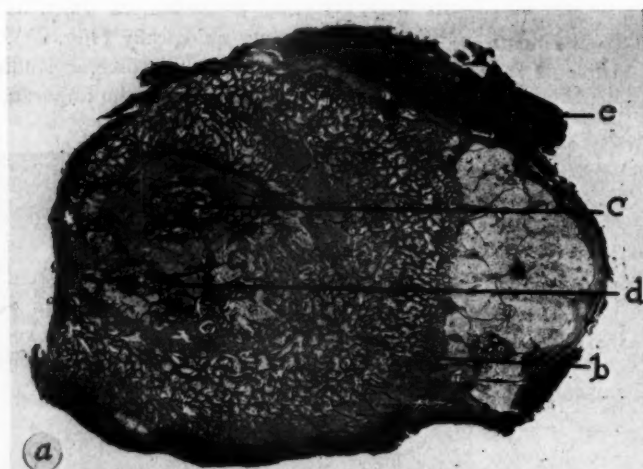
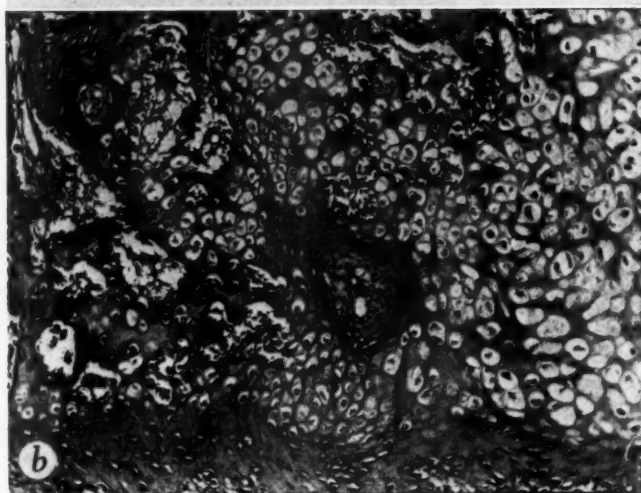
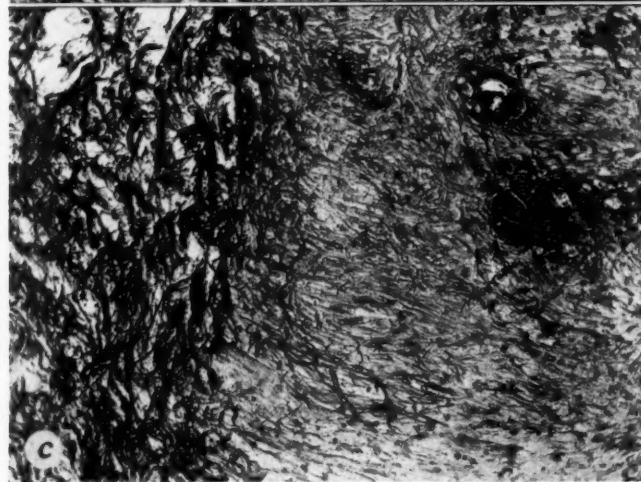


Fig. 3.

(a.) Cross section of femoral shaft through a zone of periosteal reaction three months after three exposures to 20 watts of ultrasonic power for five minutes. The origins of the next four sections are indicated (hematoxylin and eosin; x4).



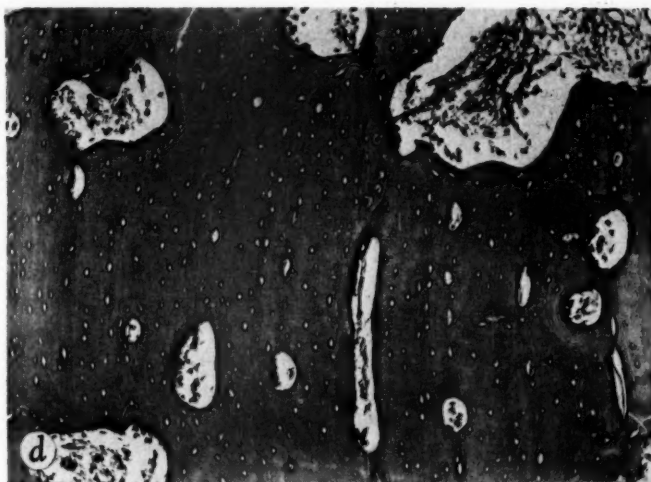
(b.) Endochondral formation of bone occurring subperiosteally.



(c.) Dense fibrous tissue that has replaced the original marrow contents.

Fig. 3.

(d.) Remains of the original cortex showing loss of normal architecture of cortical bone and loss of osteocytic nuclei.



(e.) Thickened periosteum with subperiosteal formation of new bone.



(f.) Cortex of the necrotic segment between two areas of periosteal reaction. Note loss of osteocytic nuclei but retention of haversian architecture (all hematoxylin and eosin; x95).



broken up. The remainder of the section is comprised of a growth of new bone occurring under an elevated and thickened periosteum. Figure 3b, c, d and e show higher magnifications of the areas just described. Figure 3f is a section through the necrotic segment of the same bone seen roentgenologically to lie between the two zones of periosteal reaction. The loss of osteocytic nuclei can be seen, although the haversian units have remained fairly intact.

Conclusions

1. The response to apparently uniform amounts of ultrasonic energy is variable. All eight femora showing extensive changes occurred in dogs receiving twenty watts of ultrasonic power. However, of the eleven femora that appeared normal roentgenologically, five received 15 watts and six received the larger dose of 20 watts.
2. As in many diseases, negative results of roentgenographic study after exposure to ultrasonic energy do not rule out changes in bone.
3. Ultrasonic energy is capable of dramatic destructive changes in bone, as well as of osteogenesis. It should be noted that the technique of application of ultrasonic energy used in this study is not that advised for clinical use. Although the

wattage used was within the limits considered safe for human therapy, the stationary technique concentrated this energy at one spot. With the stroking or massaging technique used clinically, the heating effect is not allowed to become cumulative.

4. Although our results should not be used to condemn the clinical use of ultrasonic energy, they should warn against promiscuous application of this form of energy by untrained personnel.

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PRESCRIPTION WRITING

Careless prescription writing may give the patient the impression that there is careless examination and diagnosis. Whether the prescription be written in English or Latin, the important thing is to so write it that it will not be all Greek or Sanskrit to the pharmacist, and that he will know exactly what the prescriber wants.

There were many stories about the illegible handwriting of Horace Greeley, and we just heard a revised up-to-date version of one of these, but it had to do with a physician's prescription. It concerns a man who got a prescription which was described as having been written in the doctor's usual illegible scrawl. It seems the

man recovered before he got around to having the prescription compounded, so he put it in his card case and forgot about it. Later he found a slip of paper in the card case and could not figure out what it was. So he tried it in different ways. For two years he used it as a railroad pass; several times he gained admission to Rockefeller Center Music Hall; it got him into the Yankee Stadium and an exclusive club; he used it as a note from his boss to the cashier for a raise in salary; and finally he brought it home and gave it to his daughter. She played it on the piano and won a scholarship in a conservatory of music.—From the *Pennsylvania Medical Journal*, February, 1952.

DEGENERATION OF THE KIDNEY TUBULES (LOWER NEPHRON NEPHROSIS) ASSOCIATED WITH ELECTROLYTE IMBALANCE

Preliminary Report

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NOT INFREQUENTLY the pathologist has been unable to account for the cause of death in a patient who has died without adequate organic pathology.

In many of these instances degeneration of the kidney tubules may have been found in varying degrees of severity. This has not usually been considered to be adequate to account for the death of the patient unless it has been associated with anuria.

The finding of degenerative changes in the kidney tubules has been called lower nephron nephrosis,¹⁴ transfusion reaction,^{1,6,7,9} renal anoxia,¹⁷ crush syndrome,^{2,4,9} traumatic anuria,^{3,9,18} septic abortion kidney,²¹ pigment nephrosis and a variety of other things.^{5,11} In addition it has been found to be associated with burns,¹² severe trauma, toxemia of pregnancy, mushroom poisoning, delirium tremens, black water fever,^{9,16} carbon tetrachloride, ethyl glycol poisoning,^{10,20} sulphanilamide sensitivity,^{8,13} and retroperitoneal hemorrhage associated with obstetrical difficulties.^{19,22}

We have reviewed many of the case reports in the medical literature portraying degeneration of the kidney tubules. All of those cases which indicated electrolyte studies revealed an electrolyte imbalance. This finding, however, was given no further consideration.¹⁵ In all of the other cases, where electrolyte studies were not done, the nature of the illness or the symptoms make it appear logical to expect that an electrolyte imbalance could have existed in those cases. The symptoms which suggest this possibility are vomiting, diarrhea, fistula, extensive edema, exudative losses (burns), dehydration,¹⁴ abdominal distension, ileus, septicemia, inadequate nutrition and the common practice of administering glucose and saline. All of these factors are notorious in their ability to cause a loss, or a shift, of the electrolytes.

Complete blood electrolyte studies and water

Presented at the meeting of the Minnesota Surgical Society, Minneapolis, October 31, 1953.

TABLE I.

	No Organic Postmortem Findings Group I	Organic Postmortem Findings Group II
Carcinoma g. i. tract	3	2
Obstructive jaundice	1	
Esophageal stricture	1	
Obstructive duodenal ulcer	2	2
Intussusception	1	
Perforation g. i. tract (Appendicitis, ulcer, diverticulitis)		5
Esophageal v.v.		1
Mesenteric thrombosis		1
Small bowel obstruction		1
Total	8	12

and electrolyte balance studies were done on 102 major surgical cases for other purposes.

Among these were eight patients who died without adequate organic postmortem findings to account for the death and twelve patients who presented adequate pathology. Both of these groups had suffered an electrolyte imbalance and showed tubular degeneration in the kidneys. The nature of their primary disease is shown in Table I.

In Group I, the disease condition was corrected surgically, but in all instances the patients did poorly in the postoperative period and finally died without evidence of organic complications. All of these eight patients presented tubular degeneration in the kidneys as the only significant post-mortem finding.

In Group II, three of these patients were not operated upon as the stage of their disease did not seem to warrant it. The others had emergency surgery. All of these patients did poorly and died with sufficient organic pathology to account for their death. In addition tubular degeneration in the kidneys was found at post-mortem examination. In Group II, the diseases were, on the whole, more severe than in Group I in that many of these patients suffered initially from peritonitis in addition to the underlying primary disease. All of these patients in Group I and Group II were known to have an electrolyte imbalance. Anuria or oliguria was a finding in four of these cases. It was not a consistent

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TABLE II.

	Number Patients Showing Electrolyte Abnormalities	
	Group I	Group II
Hyponatremia	0	1
Hypernatremia	3	4
Hypopotassemia	3	7
Hyperpotassemia	1	0
Hypochloremia	3	10
Hyperchloremia	2	2
Acidosis	3	9
Alkalosis	3	5
Hyperglycemia	7	7
Uremia	5	8

all items. She died twenty-five days after surgical release of common duct stone. During this post-operative period she continued to vomit and was given only glucose and saline until three days before her death when the electrolyte imbalance was recognized and an attempt made to correct it. Postmortem examination revealed no organic cause for death. The kidney tubules showed extensive (4+) tubular degeneration (Fig. 1).

Another instance in which the patient re-

TABLE III.

M. L., Age 74	Blood Plasma	Average Balance for Three Days				Postmortem Findings
		In	Out	Balance	Urine	
Obstructive jaundice	Na 170	386	19	+367		Pulmonary congestion. Myocardial fibrosis. Tubular degeneration.
	K 2.35	162	44.3	+117.7		
25 days—Glucose and saline intravenously	Cl 65.6-122.0	297.7	19.2	+278.5		
	CO ₂ 50.9-19.8					
	BUN 158					
	Sugar 365					
	Water balance	3366	2284	+1082	1252	

TABLE IV.

L. M., Age 43	Blood Plasma	Average Balance for Seven Days				Postmortem Findings
		In	Out	Balance	Urine	
Ruptured ileitis	Na 154	24.47	10.97	+13.50		Peritonitis. Hydrothorax. Br. Pneumonia. Tub. Degen. 3+ showing regen. (recovered from electro-imb. 8 days pre-death.
Subdiaphragmatic Abscess (Operated)	K 2.2	112.02	87.10	+24.90		
	Cl 89.0	149.3	101.1	+48.2		
	CO ₂ 36.5-15.9					
	BUN 70					
	Sugar 137					
	Water balance	3218	3101	+117	1106	

TABLE V.

E. G.	Blood Plasma	Average Balance for Four Days				Postmortem Findings
		In	Out	Balance	Urine	
Cancer colon resected	Na 148.0	100	152.3	-52.3		Died 48 hrs. postop. Cerebrovasc. Head post. not done. Old subdiaphrag. abscess. PMN infiltra. in spleen. No tubular degeneration.
Old diaphragmatic abscess	K 3.5	45.5	44.8	+ .8		
	Cl 111.0	129.1	143.0	-13.9		
	CO ₂ 28.1					
	BUN 11.0					
	Sugar 145.0					
	Water balance	2775	2521	+253	1277	

finding. Nine of these patients received blood transfusions. Only one mild transfusion reaction was encountered. The nature of their blood electrolyte imbalances is recorded in Table II.

There was no constancy in the abnormal electrolyte pattern. Every patient was found to be abnormal in three or more items. On the whole when the electrolyte pattern was more extensively disturbed, the degree of tubular degeneration was likewise greater.

A characteristic study pattern can be observed in Table III in which it can be seen that the patient suffered a severe electrolyte imbalance in

covered from the electrolyte imbalance with death attributable to peritonitis is shown in Table IV. This patient died from peritonitis eight days after she had recovered from a severe electrolyte imbalance. In this instance evidence of regenerating tubular disease was shown in the kidneys (Fig. 2). This finding was also observed in two other patients who had recovered from their electrolyte imbalance and died eleven days and twenty-four days, respectively, later from other factors.

A third group of patients were studied for control. Among these were serious diseases such as carcinomatosis, diabetic coma, etc., so that if the disease could have caused tubular degenera-

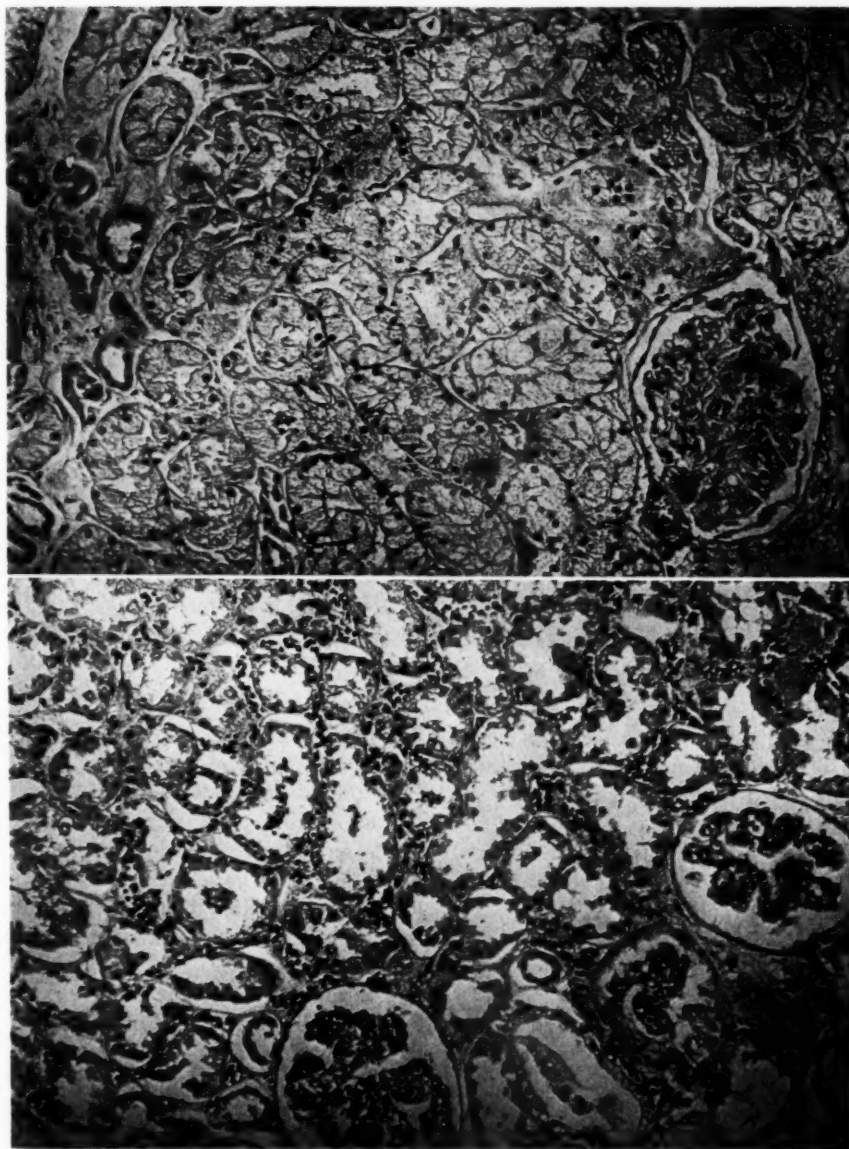


Fig. 1. Obstructive jaundice; operative release. Twenty-five days of glucose and saline. Electrolyte imbalance severe (See Table III). Tubular degeneration 4+ involving all areas of the kidneys. Cells hydropic-glomeruli normal. No oliguria. No organic cause for death found post mortem.

Fig. 2. Ruptured ileitis, peritonitis. Postoperative hypopotassemia, hypochloremia, alkalosis and then acidosis and uremia from which patient recovered eight days before death. Post-mortem examination revealed peritonitis and septicemia. Tubular degeneration in scattered areas (2+) showing evidence of regeneration.

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tion it should have been present in some of these. Complete studies were not done on all of the control group, but the history and physical findings suggest that an electrolyte imbalance should not

in some cases of surgical trauma. Tubular degeneration of the kidneys was not found to be present in two diabetic coma cases in the control group and, therefore, it seems that the elevated

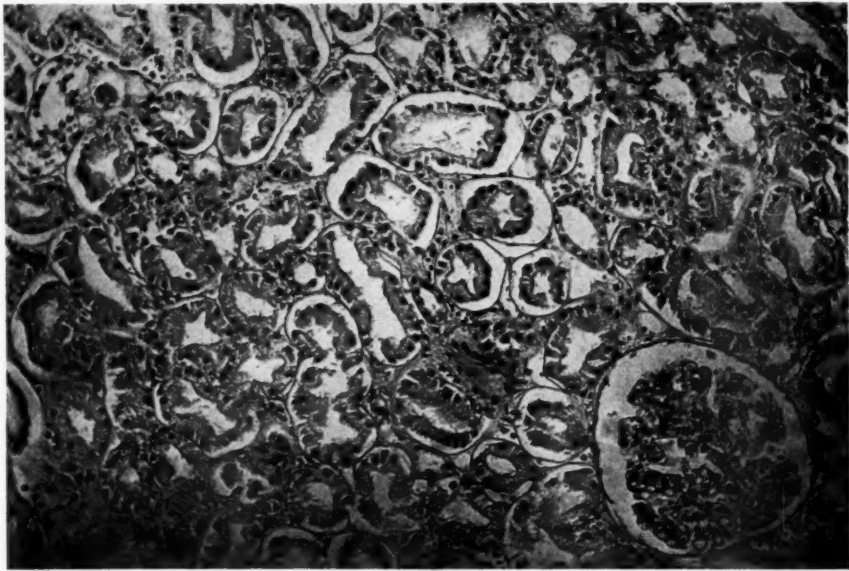


Fig. 3. Normal kidney.

have been present. Likewise, an examination of the kidneys obtained postmortem in a series of sudden deaths failed to reveal tubular degeneration in any of them.

One of the cases in this control group suffered severe disease, but was known definitely not to have an electrolyte imbalance. This case is illustrated in Table V (Fig. 3).

Comments and Conclusions

The blood urea nitrogen was found to be elevated in thirteen of the patients. It was found to be higher in those who presented the greatest degree of tubular degeneration. This is probably merely an index of the inadequacy of the kidney function.

The blood sugar was found to be elevated in all instances, but seemed to have no correlation with the degree of tubular degeneration or the severity of the electrolyte imbalance. The elevated blood sugar was not considered to be due to diabetes, except in two known diabetics, but was thought to represent a manifestation of the metabolic disturbance which is present in

blood sugar need not be considered a factor in causing the tubular degeneration.

Water balance studies indicate a positive water balance in four cases, negative water balance in one case, water equilibrium in eight cases and insufficient data in seven cases. There appeared to be no correlation between the water balance and the degree of tubular degeneration or the electrolyte imbalance.

The consistency of the known electrolyte imbalance in Group I and Group II associated with the postmortem finding of tubular degeneration, and the absence of an electrolyte imbalance in the control group associated with the finding of normal kidney tubules, suggests that the pathogenesis of tubular degeneration of the kidneys may be related to an electrolyte imbalance.

It is our conclusion from these findings that when tubular degeneration is found in the kidneys at postmortem, a retrospective evaluation of the clinical picture would, in all probability, indicate that an electrolyte imbalance had existed. When microscopic evidence of tubular *regeneration* is evident, it can also be presumed, on the

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same basis, that the patient was in the process of recovering from an electrolyte imbalance.

Any studies which are done in the future endeavoring to establish the pathogenesis of tubular degeneration of the kidneys must take into consideration the electrolyte and water balance status of the subject before concluding that tubular degeneration of the kidneys is of more specific origin.

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FINDINGS OF FIRST YEAR'S STUDY OF DOCTORS IN SERVICE

Results of the first year's survey of physicians leaving active military service are carried in a report recently issued by the AMA's Council on National Emergency Medical Service. Information obtained from this continuing questionnaire study is being used as the basis for a series of conferences with Department of Defense and Armed Forces representatives in an effort to improve the utilization of medical personnel and the formulation of a more effective voluntary officer procurement system.

During the first year of the study—July 15, 1952, to August 1, 1953—a total of 3,948 completed questionnaires revealed that the average time spent in service was 24.7 months; average tour of duty in U. S., 7.6 months; average tour of foreign duty, 17.1 months. Twenty-nine per cent felt there was overstaffing, 20 per cent understaffing and 51 per cent adequate. Of those assigned to domestic duty, 53.4 per cent were engaged in treating military personnel, 28.3 per cent in treating military dependents and 18.3 per cent in "other";

while of those assigned to overseas duty, 51.8 per cent treated military personnel, 23.8 per cent dependents of military personnel and 24.4 per cent "other." Answers to the question regarding the type of medical care provided for other than military personnel indicate that in the Army and Navy the most frequent type was outpatient care, while in the Air Force it was obstetrics and gynecology.

Regarding the question, how national and local medical associations can better serve their members in service, the following activities were suggested—more information via a newsletter, etc.; personal visits by civilian doctors to evaluate grievances; invite military doctors to civilian medical meetings; assist in locating position after discharge; assist in preventing evasion of military service; distribution of questionnaires to physicians in service; provide specialists for clinical conferences.—*AMA News Notes*.

PREVENTION OF MAJOR COMPLICATIONS DURING ANESTHESIA

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PREVENTION of complications is largely a matter of philosophy on the part of the anesthetist. That an ounce of prevention is worth a pound of cure is a growing philosophy in modern anesthesia. Prophylactic anesthesia requires that the anesthetist understand not only the problems of anesthesia but also the problems of surgery, as well as the individual physiology and pathology of each patient. Armed with such knowledge and the experience gained from the conduction of many previous anesthetics, the anesthetist can anticipate complications and can institute measures to prevent their occurrence. The anesthetist's ability to anticipate complications in their incipency is most important in the matter of insuring safety to the patient and uninterrupted successful completion of the operation. Such ability is more important than any ability to revive the patient heroically after the jaws of death have begun to close.

Three requisites for prevention of complications are awareness of changes in the patient, early diagnosis of changes, and early treatment of minor complications. These will be discussed separately, first as to the means available today for practicing them, and later as to the means we may hope to have available after ten to fifteen years of progress.

Awareness

Awareness of changes in the patient is the most important requirement and also the most difficult to practice constantly and adequately. Man is aware of his environment through his five senses: sight, smell, taste, hearing and touch. John Snow used these same senses to study his patients, and during the one hundred years between his time and ours, improvements in the efficiency of these senses have been slow. At present, prevention of complications must depend mainly on the constant and uninterrupted use of these unaided senses. Certainly such prevention will always require alertness as well as competence on the part of the anesthetist. To be

constantly in contact with the condition of the patient from moment to moment, the anesthetist must necessarily be in close proximity to him at all times. An arm's length is possibly the maximal distance that should separate the two and the practice of some early anesthetists of leaving the operating room without providing for intelligent constant attendance of the patient is not generally tolerated today. The anesthetist must necessarily be in close proximity in order to employ his five senses in unceasingly evaluating the condition of his patient.

Hypoxia is the greatest threat to the safety of most patients and is one of the most serious of complications. The symptoms of acute severe hypoxia are easily recognized and attract the attention of the surgical team as well as the anesthetist. On the other hand, the symptoms of chronic hypoxia of a slight but dangerous degree may be insidious; hence, they can easily be overlooked by the busy anesthetist who may be responsible for duties other than the constant observation of the patient. Too frequently the history, after cardiac arrest, is: "The patient was just fine and everything was going along nicely when all of a sudden the heart stopped." At necropsy no cause of death can be found and a diagnosis of "vagovagal" reflex may be made. This diagnosis made by exclusion may or may not be correct. Operations on the human heart itself have given some of us an opportunity to observe the stamina of this organ and to develop a high regard for its ability to function under difficulty. It seems logical that in some cases of unexplained cardiac arrest the history of the sequence of events leading up to the arrest may not have been just as they seemed even to the honest anesthetist. Before arrest, some hearts have likely been subjected to unfavorable circumstances but have been able to maintain some function under stress. The arrest, instead of being an initial sudden occurrence, was the climax to a slow decrease in the ability of the heart to compensate for the stress. If the anesthetist had become aware that the heart was under stress, preventive measures could have been taken to

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remove the unfavorable circumstances and the ultimate arrest could have been avoided.

All the numerous ways in which hypoxia can occur cannot be mentioned here but they should always be in the back of the mind of the alert anesthetist. Regardless of the type of surgery and the manner of draping, some part of the patient's skin or nails should be exposed in good light, so that the color can be observed and cyanosis prevented. As will be mentioned later, the color of the skin is a grossly inaccurate indication of the degree of oxygenation of the blood. However, it is certainly better to be able to observe the color of the skin at frequent intervals than not to be able to see any part of the patient. I like to have my hand on the patient's face, neck, chest or abdomen where I can feel the respiratory motion, even when I can clearly see the motion of the breathing bag on the anesthesia machine. In this way I am doubly aware of the respiration through two senses—sight and touch. If the respiratory passages become partly obstructed, I may be warned by a third sense—hearing.

If a finger is kept in the vicinity of an artery of the patient, a subconscious contact can be maintained with the circulatory system and its efficiency. Even though the anesthetist is not able to concentrate constantly on the rate and rhythm of the pulse, any sudden change in these characteristics will have an effect similar to the sudden stopping of a ticking clock in a quiet room. The recording of the blood pressure and pulse rate at frequent intervals is indispensable but at best it is an intermittent method, and to prevent complications a constant method is desirable. Even the extremely conscientious anesthetist cannot record all these readings much more frequently than once every five minutes, and when other duties must be attended to, the interval becomes much longer.

Being a co-operative and industrious individual, the anesthetist frequently becomes responsible for too many operating room chores such as assisting with draping, adjusting surgical lights, adjusting the operating table, wiping the surgeon's brow and so forth. Even the administration or supervision of the supportive therapy may be his responsibility. These added duties must of necessity distract his attention from the condition of the patient, much to the patient's disadvantage. Even the maintenance of his own anesthesia equipment in a properly functioning

condition is sometimes a dangerous distraction from attention to the patient.

It is, therefore, evident that to become instantly aware that a complication is impending the anesthetist must be constantly aware of what is happening to and in his patient. There is much room for improvement by the development of more attentive habits by anesthetists, but on the other hand, it is humanly impossible for any individual to effect complete concentration on any factor for hours on end without interruption. As will be discussed later, the answer to this problem is the development of instruments which can function unceasingly. It seems possible that awareness might be made mechanical.

Diagnosis

Let us imagine for a moment that we have reached that stage of development of the specialty of anesthesia where constant awareness has been made possible and the anesthetist is immediately conscious of every change as it occurs in his patient. Then he must diagnose the change and evaluate it. This diagnosis will likely never be mechanical, and it is the function which makes anesthesia necessarily the practice of medicine in contrast to a series of technical maneuvers. The ability to diagnose is based on an understanding of the basic sciences. In addition, judgment is required, and judgment is based primarily on training and experience.

Suppose the blood pressure of the patient decreases. The anesthetist must examine many factors which might have exerted an influence to bring about the change. Then from the facts at hand he must make a decision. Basically, he must decide whether the fall in pressure is the result of a decrease in cardiac output or a decrease in peripheral resistance. Then he must go further and further into detail by constantly asking himself the question, "Why?" Rarely he may be able to make a definitive diagnosis and know minutely what is happening in his patient. All too frequently, however, the ability to make more than a provisional diagnosis is hampered by a lack of facts about the individual patient. The anesthetist may know volumes of physiology which is based mainly on animal experiments or he may know from anesthesia textbooks the symptoms and signs of many classes of complications, but rarely is he able to determine accurately the physical or chemical changes in each patient

as they occur. Most of the time he only has a gross idea about even the concentration of the gases which the patient is breathing from the bag on the anesthesia machine.

Diagnosis is necessary primarily for the purpose of indicating treatment and is not usually thought of as a preventive measure. The early and accurate diagnosis of minor complications and their effective treatment is the only way of preventing major complications. The old saying, "Great oaks from little acorns grow," seems to apply here—apparently few major complications develop suddenly from a normal state. Instead, most are preceded by a series of progressively severe minor complications which either were not recognized or were misdiagnosed or mistreated. When a cardiac arrhythmia develops during anesthesia, the anesthetist must first realize that the arrhythmia exists, then he must diagnose it, evaluate its significance, and, if necessary, institute treatment to eliminate it and prevent more serious cardiac complications. But under ordinary circumstances, how will he be able to make a definitive diagnosis? He may think the arrhythmia is due to premature contractions, but how can he know whether the origin of the premature contractions are auricular, nodal or ventricular? When an experienced cardiologist would hesitate to venture diagnosis from palpation alone, how can an anesthetist definitely differentiate a tachycardia of supraventricular origin from a tachycardia of ventricular origin? Yet, the accurate diagnosis is important because the former would likely not demand immediate treatment, but the latter should be treated immediately, perhaps with an intravenous dose of a procaine-like drug or quinidine. How can one know the heart rate of a patient with both an auricular fibrillation and a variable pulse deficit? The answer to all these questions is evident—by the use of an electrocardiograph—yet how many patients have an electrograph attached before a routine operation?

Early diagnosis is the crux of the whole problem of cardiac arrest on the operating table. Preparation of emergency equipment and an outline of procedure for action by the surgical team is important but is of no use in salvaging a valuable citizen unless the anesthetist recognizes cardiac arrest at almost the moment it occurs. The average delay of three to five minutes before cerebral damage occurs is usually needed to open

the chest and start cardiac massage. If the anesthetist is not aware of the complication or is not able to make a definite diagnosis until after two or three minutes have elapsed, the chance of saving an undamaged patient will be slim. Those who have been faced with the problem know that such a diagnosis is difficult, when dire consequences may result from a snap and unverified diagnosis.

What evidence is necessary for the early diagnosis of cardiac arrest: lack of ability to get a blood-pressure reading or to feel a radial pulse? Several times every month each of us is jolted by the sudden inability to get a blood-pressure reading or feel a pulse, only to find that some mechanical defect has occurred in our apparatus or that the arm has been put in such a position that the circulation has been impeded. The investigation of such factors in the differential diagnosis of cardiac arrest takes time. The raising of an alarm the very instant that we suspect cardiac arrest only to admit a mistake within a few moments several times a month will cause the surgical team to lose faith in us. Then when a real cardiac arrest occurs, we will lose time convincing them that it is not just another false alarm. If the thorax or abdomen is open, the surgeon may be asked to verify our suspicions by palpating the heart or great vessels, but if the operation is elsewhere in the body, it is more difficult to make the diagnosis definitely enough and quickly enough to justify thoracotomy. Future progress in overcoming the bad results of cardiac arrest is not likely to come from the development of better methods of treatment but from the development of better methods for making an early and certain diagnosis of the complication.

Treatment

Early accurate diagnosis by an alert and competent anesthetist makes early treatment possible. It is early and adequate treatment that prevents the bad results of major complications. Adequate treatment frequently depends on the preparation of equipment, drugs and plans in anticipation of the complication before it happens. It is almost correct to say that the good anesthetist must of necessity be a pessimist, always expecting the worst even when he is doing his utmost to prevent it. From previous experiences the anesthetist knows which complications are more likely to

occur in a particular patient with a particular disease, undergoing a particular operation, by a particular surgeon, under a particular type of anesthesia, and in a particular position. So in being forewarned, the thinking anesthetist should keep himself forearmed and prepared to treat such expected complications adequately.

It is sometimes necessary to treat unusual complications at unexpected times. The fact that no preparation has been made for the prevention or treatment of such complications partly explains why they seem to be fatal more often or to be followed by serious consequences. From the reports in the literature, cardiac arrest would seem to occur more frequently in good-risk patients than in poor-risk patients. If so, this fact might be explainable on the basis that poor-risk patients are observed closely every moment, that every diagnostic aid is used to follow the condition of such patients, and that preparation is made to treat the major complications which are expected but which are prevented in their incipency. On the other hand, in the ordinary good-risk patient no complications are expected, so that no greater than ordinary preparation is made to prevent or treat unexpected complications. Much attention to monotonous detail is necessary to keep everything set up and in good working order. In addition to being a pessimist, the careful anesthetist must also possess some of the characteristics of the overly meticulous spinster housekeeper as far as his equipment is concerned. Even the presence or absence of an efficient aspirating catheter may make the difference between life and death for the anesthetized patient whose respiratory passages have become obstructed with liquid or semisolid material. As a general statement, it might be said that the prevention of major complications during anesthesia depends on the willingness of the anesthetist to spend his time and effort fussing with little details which at the moment seem inconsequential.

In summary, it may be said that major complications are best prevented by treating them before they happen.

Instrumentation for the Future

It has been shown that continuous monitoring of the patient is necessary in order for major complications to be prevented. The anesthetist

with his unaided senses is able to provide only intermittent monitoring. The shorter the intervals between observations the safer it is for the patient, but it is humanly impossible for the anesthetist to provide continuous observation of the patient without instruments to aid his senses. A few of the instruments, mostly electronic, which have shown promise of being of help will be mentioned.

Cardiotachometer.—From leads similar to those used for electrocardiography the pulse rate may be shown on a dial or recorded on paper or film. Whereas the anesthetist with his finger on a pulse can only estimate the average pulse rate, the cardiotachometer can indicate the rate from one beat to another and is therefore more sensitive and more accurate. An alarm device can be used with the cardiotachometer, so that if the pulse rate falls below a predetermined figure a bell will ring, a light will flash or some other alarm will go off to warn the anesthetist that all is not well with his patient.

Direct Blood-pressure Recorder.—The determination of blood pressure by the auscultatory, oscillatory or palpation method is inaccurate and subject to variation in individual interpretation. The direct recording of the blood pressure through a needle or small flexible tube in a peripheral artery is objective, more accurate and constant. In addition, there is promise that from the recorded pulse contour a reasonably accurate estimation of the stroke volume of the heart can be calculated,³ and, therefore, the cardiac output can be followed from minute to minute.

Electrocardiograph.—The value of this instrument is recognized by all. At present it offers the most practical means of diagnosing cardiac arrhythmias and allowing the anesthetist to be cognizant of changes in the heart before these changes reach the status of major complications. Like so many of the electronic instruments, it introduces an explosion hazard into the operating room. However, instruments are available whereby the electrocardiographic pattern can be shown on a cathode-ray screen which is enclosed in an explosion-proof housing, safely situated at the side of the anesthetist. By pressing a switch the anesthetist can cause any significant patterns

to be recorded on the direct-writing electrocardiograph which has been set up in a nonhazardous area.

Electro-encephalograph.—The determination of the depth of anesthesia by the signs and symptoms as outlined by Guedel is not accurate. The signs vary from individual to individual, and the interpretation of a group of signs is not always the same to different anesthetists. There is good evidence to indicate that the electrical activity in the brain decreases as the depth of anesthesia increases. The integration of the electrical activity of the brain as recorded with an electro-encephalograph is therefore a valid means of objectively measuring depth of anesthesia, which can be shown on the dial of an anesthesia depth meter or recorded. This principle has been used to activate a servomechanism whereby the anesthetic agent is automatically administered if the electrical activity of the brain increases and the depth of anesthesia decreases below a preset degree, whereas the rate of administration of the anesthetic agent is automatically decreased if the anesthesia becomes too deep and the electrical activity of the brain decreases.¹

Thermometer.—During recent years much attention has been focused on the changes in body temperature which occur during anesthesia and on the effects of these temperature changes. Hyperthermia during anesthesia and operation is generally considered to be detrimental to the welfare of the patient. Especially in children the body temperature may rise to dangerous levels under conditions which are apparently similar to those well tolerated by most adults and some children. A marked rapid rise in body temperature demands immediate treatment, but how is the anesthetist to know that it is rising unless it is being recorded? Electronic and mechanical thermometers are available for continuously recording temperature in various parts of the body during anesthesia. Induced hypothermia is being employed more and more, especially during operations on the heart and great vessels for cyanotic heart disease. This hypothermia must be controlled, and to be controlled some convenient type of thermometer must be used.

Oximeter.—No condition is so likely to result in major complications as a severe decrease in

the efficiency of the system for transporting oxygen to the tissues. It is well known that as the oxygen content of blood decreases, the color tends to change from red to blue, but the gradation of the change is too small to be accurately estimated by the human eye. Some of the newer models of oximeters make it possible for the delicate changes in the color of arterial blood to be constantly monitored by a photoelectric cell and for the changes to be shown on a dial or recorded on paper or film as absolute percentages of saturation of the arterial blood with oxygen. The Pauling type of oxygen meter makes possible rapid and accurate determination of the concentration of oxygen in anesthetic mixtures of gases and has been of great aid in studying the effects of known mixtures.

Carbon-dioxide Meter.—Carbon dioxide is of almost as much importance as oxygen, and the concentration in the blood is kept within narrower limits even than the concentration of oxygen. Accurate control is provided by nature for a very important reason and it behooves us as anesthetists to strive to see that nature is not hindered in providing safeguards. Anesthesia may mask the symptoms of change in carbon-dioxide concentration which occur readily in the unanesthetized individual. For that reason instruments for determining the concentration of this gas are important. Extremely accurate intermittent determinations are possible by use of the mass spectrometer, but continuous determination of the concentration in the respiratory gases is possible by several other methods.²

pH Meter.—One reason why carbon dioxide is so important is that it plays a big role in keeping the hydrogen-ion concentration within the narrow range compatible with life in the mammal. The increasing use of the combination of respiratory depressing agents and artificial respiration during anesthesia has increased the demand for instruments to show the changes in pH of the blood during the time when the respiratory center or other parts of the respiratory mechanism are paralyzed. Many unexplained major complications during anesthesia may well be the indirect effect of an unsuspected radical alteration in the pH of the blood. So far as I know, no instrument is available at present for

continuously recording this factor, but in the future such instruments will be developed.

Up until now, only the advantages of instrumentation have been stated. The disadvantages are readily evident. Most instruments are still in the experimental stage of development and have been used largely for research studies, while commercially available models which are sturdy and simple enough to be used routinely by the clinical anesthetist have not been perfected. In their present form, many instruments are bulky, and if all that have been mentioned were employed at once they would fill the average-sized operating room. Most are electronic and because of the explosion hazard cannot be used when inflammable anesthetic agents are being administered. The operation of most of these instruments is complicated and the services of personnel trained in electronics are required. Even if the anesthetist has the ability to set up, run and service the instruments, he will not be able to administer the anesthesia and care for the instruments at the same time.

All these objections are legitimate but need not be appalling. Much work is yet to be done in perfecting the instruments for clinical use, but at least we have an ideal, a hope and a goal to work toward. Just because most of us cannot build an automobile or cannot service any defect in operation of our automobile does not keep us from deriving benefit from the use of automobiles. It would be a sad state of affairs if everyone who rode in an airplane had to be able to fly it unaided.

The aircraft industry makes a good comparison to the specialty of anesthesia. Before and during World War I, the pilot had a crude machine and few mechanical aids. He flew "by the seat of his pants" in about the same way that most of us give anesthesia today. However, the complexity

of new developments did not deter the members of the aircraft industry, so that today huge ships with panel after panel of dials and safety devices travel faster than sound, sometimes without a human pilot. The anesthetist also must eagerly accept mechanical aids as they become available in order to facilitate the safety of his patients and put anesthesia on a really scientific basis. The problem of personnel will have to be solved in the same manner as used by the surgeons, namely, by the development of a team. An anesthesia team will be more expensive than the individual anesthetist, but the American public has always been willing to finance anything which it can be convinced is for its own good. When the surgeon himself could not attend to all details of an operation, the surgical team was accepted without question. It is up to us as anesthetists to provide safety and then to sell it to our patients. Safety means freedom from complications.

Summary

1. The factors in the prevention of major complications during anesthesia are awareness of change in the patient, early diagnosis and early treatment of minor complications.

2. Continuous monitoring of the patient is possible only by the use of instruments which are now being perfected.

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The contrast in tuberculosis mortality rates of the Japanese in Hawaii as compared with the rates in Japan is of interest. In Hawaii, the rate for the five-year period, 1918 through 1922, was 132 per 100,000 as compared with 12 in 1952. In Japan, on the contrary, the rate for 1918 through 1922 was 233 and, in 1951, the last available figure was 111. Similar differences exist

in other races such as the Filipinos, Chinese, and Koreans, all having much lower rates in Hawaii than those reported in their respective countries of origin. In all probability, higher living standards and better nutrition are the most important factors to account for these differences.—HASTINGS H. WALKER, M.D., *American Review of Tuberculosis*, December, 1953.

PAROTID TUMORS

A Report of Six Cases

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FEW TUMORS have received such exhaustive studies and are still so poorly understood as tumors of the parotid gland. The surgeon approaches parotid tumors with timidity because of facial nerve paralysis resulting from their removal. The pathologist is hesitant about prognosticating which tumors are apt to recur after removal. As a result many patients are advised to forego surgery for a period of "observation" because of the fear of resulting facial nerve paralysis; occasionally x-ray therapy is offered as a therapeutic measure. These factors contribute to the rather discouraging results which are associated with treatment of parotid tumors.

Parotid gland tumors are rather rare. At Los Angeles County Hospital in 37,000 consecutive autopsies,¹⁷ the incidence of parotid tumors was found to be only .023 per cent. Except in large tumor clinics, few surgeons have had much experience with these tumors. In 1943 a survey was made in the Philadelphia area¹⁴ where it was found that in twenty-four hospitals, during a quarter of a century, there were 233 patients with mixed tumors of the parotid gland operated on by seventy-three surgeons. The average was 3.2 patients each. Only six surgeons had ten cases or more.

The origin of parotid tumors is not well understood.^{3,6} Virchow in 1863 was the first to describe these tumors.¹² Since many of them contained cartilage, he believed them to be of mesoblastic origin and termed them "diffuse endochondromas." Cohnheim in 1877 speculated that in early embryonic development, more cells were produced than necessary in the salivary glands, and tumors often occurred because of their great capacity for growth. Wartmann in 1879 believed these tumors to be endothelial in origin. Krompacher in 1908, observing the basal layers of stratified epithelium, called these tumors basalomas. Favata⁵ in 1948 was able to culture, in vitro, cells from mixed tumors and keep them alive for 140 days. He believed that there is

evidence that mixed tumors may be derived from cells lining the ducts of salivary glands. Ligation of the salivary ducts in dogs is said to produce mixed tumors of the parotid gland. The interference with the flow of secretion in the production of these tumors may explain why recurrence happens so frequently when only a portion of the gland is removed in man. Of great importance is the recent work of Gross⁷ who has produced salivary gland carcinomas in mice by injecting a filterable agent. In eighty-four mice of a certain strain, he was able to produce bilateral salivary tumors in fifteen mice. They developed on an average of 3.3 months after injection.

The conflicting ideas relative to the origin of parotid gland tumors have made a clear classification difficult.²⁰ A simple classification¹⁵ which has been suggested is as follows:

1. *Cysts*—These are caused by obstruction, atresia, or congenital defects in the duct system. They are rare and benign.

2. *Adenomas*—Adenomas are well encapsulated tumors and grow slowly. They are composed chiefly of glandular tissue and are benign.

3. *Adenocarcinoma*—This group of neoplasms are usually stated to comprise about 10 per cent of all parotid tumors, although some reports suggest that 40 per cent would be a more accurate figure. They are poorly demarcated tumors that rapidly infiltrate surrounding structures. They include the oncocytoma and cylindroma and are extremely malignant.¹⁸ The recurrence rate is thought to approach 100 per cent, and usually takes place within a five-year period, 85 per cent recurring within three years, although some of these malignant tumors have been known to recur as long as forty years after removal. They invade vital structure and may metastasize to lymph nodes, bone, liver, spleen, lung, pancreas, thyroid, ovaries, adrenals, dura and brain. Total removal of the parotid gland is imperative, and many believe a radical dissection of the node-bearing area is indicated. Deep x-ray therapy has proven to be of little value in these tumors, as most parotid tumors are radioresistant.

4. *Mixed Tumors*—This group is the most controversial and comprises about 75 per cent of all parotid tumors. They are composed of three component structures: (a) complexes of epithelial cells in cords or duct-like structures; (b) connective tissue of the mucoid type; (c) substances identified as cartilage or pseudo-cartilage. They usually have a definite capsule and are rarely infiltrative. The histological structures are extremely variable¹⁰ and are, therefore, difficult to classify. Mixed tumors are notorious for recurring after they have been removed. The recurrence rate is stated to be between 25 per cent and 40 per cent; the average recurrence time is seven years. Because they are prone to recur, there is persistent disagreement

Inaugural thesis presented before the Minnesota Academy of Medicine, Saint Paul, Minnesota, November 11, 1953.

PAROTID TUMORS—HEDIN

among pathologists as to whether mixed tumors of the parotid gland are benign or malignant. It does not seem possible to foretell the behavior of a mixed tumor from microscopic sections alone. The clinical course must be correlated and even then an accurate prognosis is often impossible. McFarland,¹⁴ who has made an

5. *Entodermal Cysts.*—This group consists of the adenolymphomas or papillary cystadenoma lymphomatosa. They are rare, benign and arise from lymphoid conglomeration that surrounds the first bronchial cleft and resemble tonsillar tissue. They should be removed.

6. *Tumors of Nonglandular Origin.*—These parotid

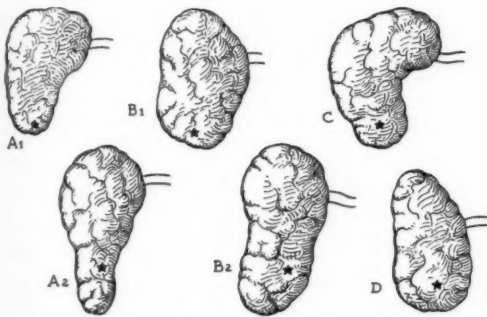


Fig. 1. Various shapes of the parotid gland (after McCormack, L. J.; Cauldwell, R. W., and Anson, B. J. Courtesy Surg., Gynec. & Obst.).

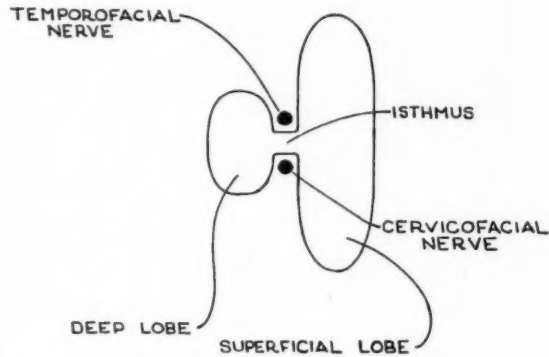


Fig. 2. Arrangement of the lobes of the parotid gland showing the isthmus at which site the facial nerve divided into the larger temporofacial branch and the smaller cervicofacial branch.

extensive study of mixed tumors of the parotid, attempted to find out with what accuracy pathologists could predict from microscopic sections the probability of recurrence. He submitted to eight eminent pathologists sections from fifty mixed tumors that had been followed for many years. There was no unanimity of agreement on any of the tumors. Fifty-two per cent of the tumors were diagnosed correctly and 48 per cent inaccurately diagnosed as to recurrence. The highest percentage of accuracy for any of the eight eminent pathologists was 63 per cent. From this study alone it can be seen why surgeons and pathologists are bewildered when confronted with mixed tumors of the parotid gland. Using Ewing's⁴ criteria of malignancy, these tumors have the following characteristics:

(a) *Infiltrative growth.*—Because these tumors have a definite capsule they rarely infiltrate. Should the capsule be broken, either from surgery or trauma, the tumor may infiltrate into orbit or brain.

(b) *Recurrence after removal.*—As stated previously, recurrence is far too frequent¹⁰ and this may take place as long as twenty or thirty years after removal. For this reason, the word "cure" should be used with extreme caution.

(c) *Metastasis.*—Metastases are rare. McFarland found this to occur in but 2 per cent of his cases.

(d) *Local interference with function.*—Mixed tumors may cause deafness if the external auditory canal is obstructed. Movements of the jaw may be restricted and pressure on the facial nerve may cause facial paralysis on the affected side. If Stensen's duct is obstructed, cystic retention of secretion may result.

(e) *General toxic action of absorbed tumor products.*—There is no absorption of tumor products unless the tumor ulcerates and bacterial invasion results in sepsis or septicaemia.

(f) *Local tissue destruction.*—Mixed tumors are covered by the skin of the cheek, which allows for extensive stretching and for this reason ulceration seldom occurs. The fifth and seventh cranial nerves at times become involved, causing pain and paralysis.

With these data at hand it becomes evident that in all cases of mixed tumors of the parotid gland, the prognosis should be guarded and the patient advised as to all possible eventualities.

tumors are extremely rare and may be composed of blood vessels, nerve²³ lymphoid or fibrous tissue. Hemangiomas of the parotid gland, with few exceptions, have been found only in infants.

Anatomy: The parotid gland develops during the eighth week of fetal life. The glandular structure varies in shape (Fig. 1) and is held together with loose areolar tissue. There is no definite capsule, but the gland is covered by fascia which is continuous with the fascia of the neck as it passes upward from the sternomastoid to the zygomatic arch. It is bounded in front by the ramus of the mandible and posteriorly by the external auditory meatus, tympanic plate and the base of the styloid process. The gland overlies the masseter muscle. Stensen's duct emerges from the anterior aspect of the gland and courses over the masseter muscle piercing the buccinator muscle to enter the oral cavity. In the past most anatomy books have stated that the facial nerve passes through the parotid gland substance. This information has led most surgeons to deem it impossible to remove tumors of the parotid gland without injuring the nerve and most were hesitant to try. Fortunately the researches of McWhorter,¹⁶ and later McCormick, Cauldwell and Anson¹¹ have enlightened us to the true relationship of the parotid gland and the facial nerve. They found the parotid gland is composed of a larger superficial lobe with many variable pro-

longations and a smaller deep lobe which are joined together by an isthmus. They further found that the facial nerve does not traverse through the gland, but rather *between* the two



Fig. 3. Relationship of the larger superficial lobe, isthmus (Cross-hatching), and smaller deep lobe (broken line) (after McCormack, L. J.; Cauldwell, R. W. and Anson, B. J. Courtesy Surg., Gynec. & Obst.).

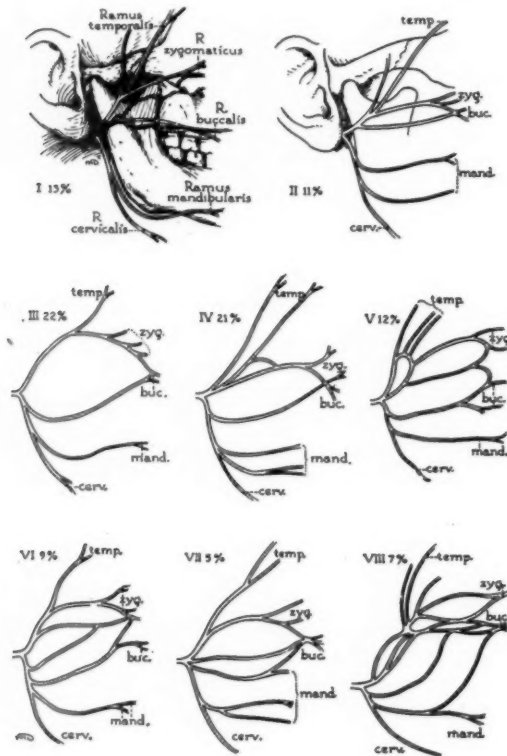


Fig. 4. Variations in the branches of the facial nerve can be catalogued into eight different arrangements.

lobes and that the nerve invariably divides to embrace the isthmus (Fig. 2). These anatomical facts have facilitated and encouraged surgeons to attempt removal of tumors without fear of resulting facial paralysis (Fig. 3). The facial

nerve emerges from the stylomastoid foramen and does not give off branches until it encounters the isthmus where it divides into two principal divisions, the temperofacial and the cervicofacial nerves. The former is two or three times the size of the latter and supplies most of the upper part of the face. These divisions usually have five terminal branches: temporal, zygomatic, buccal, mandibular and cervical. These branches anastomose freely. McCormick, Cauldwell and Anson (Fig. 4) from their dissection of one hundred individual facial nerves, concluded that the anastomosis of the terminal branches could be catalogued as belonging to one of eight types. With these facts at hand the surgeon has been reassured as to the possibility of successfully removing these tumors without resulting disfigurement to the patient.

Most patients seek treatment for parotid tumors because of embarrassment from the unsightly swelling, limitation of motion of the mandible, pain or sudden rapid growth of the tumor.²²

Treatment: Treatment should be directed toward the complete removal of all tumor tissue with the hope of no recurrence of the tumor.^{1,21} Various procedures¹⁷ have been carried out consisting of simple enucleation of the tumor, lobectomy, or radical removal of the entire parotid gland along with the node-bearing areas. When one is dealing with adenocarcinoma, probably the procedure of choice should be the complete removal of the parotid gland.⁹ Whether or not excision of the node-bearing area is indicated depends on the size and involvement of the tumor. In the case of the mixed tumors, lobectomy would appear to suffice. X-ray therapy is reported to be ineffective in the treatment of most types of parotid tumors. Technically intratracheal anesthesia, prevention of blood loss by temporary or permanent ligation of the external carotid artery, and meticulous care in separating the two lobes of the parotid gland and preserving the facial nerve will facilitate the successful removal of parotid tumors.

Case Reports

Case 1. W. P., male, aged sixty, (Fig. 5) presented himself complaining of a tumor on his left cheek which he stated had been present for two years. He stated it had been getting larger during the past two or three months. The tumor was the size of a hen's egg and was located below the zygoma and anterior to the angle of the jaw. A diagnosis was made of a parotid

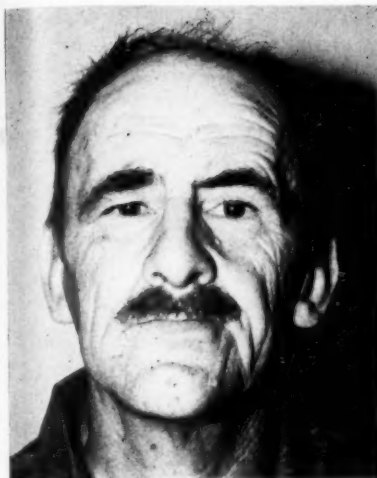


Fig. 5. W. P.—Mixed tumor of the parotid. Tumor removed by simple excision without injury to the facial nerve, except for slight inability to elevate the forehead on the affected side.

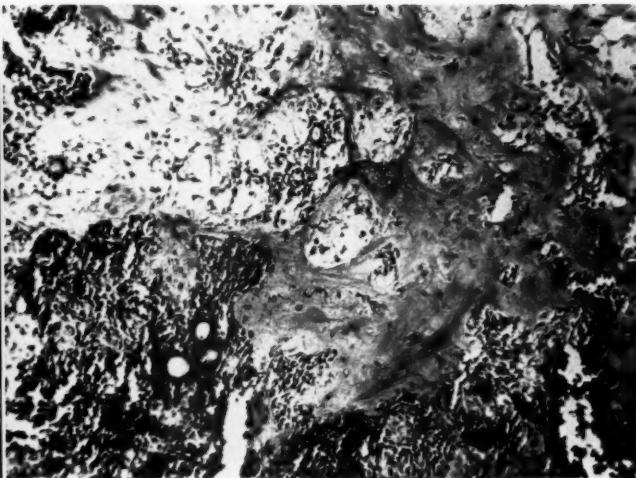


Fig. 6. Microscopically, tumor was composed of cartilage, myxomatous tissue, and masses of epithelial tissue. Some definite glands are also formed. Mixed tumor of the parotid.

tumor. On November 1, 1946, under local anesthesia the tumor was excised and it was thought at the time of surgery that a portion of the facial nerve was "in the tumor" and was sacrificed. He was discharged from the hospital on the fifth postoperative day and made an uneventful recovery. He has no facial paralysis except his inability to elevate his forehead on the affected side. There has been no recurrence.

Pathological diagnosis: Mixed tumor of the parotid gland. The tumor measures $3\frac{1}{2} \times 2\frac{1}{2}$ cm., is firm, grayish-yellow in color. It is friable and appears to be poorly encapsulated. Microscopically the tumor is composed of cartilage, myxomatous tissue, and masses of epithelial tissue. Some definite glands are also formed (Fig. 6).

This patient should have had a general anesthetic and lobectomy.

Case 2. M. C., female, aged twenty-nine, complained of a swelling just below the angle of her jaw which would vary in size. She stated she had noticed the swelling for the past year. The tumor was compressible and slightly tender. A diagnosis was made of a parotid tumor and on June 28, 1948, she was operated on under local anesthesia. A cyst was encountered which contained a cloudy yellowish fluid. The cyst was excised. She made a rapid recovery and was discharged on the second postoperative day. There was no evidence of facial paralysis and there has been no recurrence (Fig. 7).

Pathological report: Cyst from the parotid gland shows no evidence of neoplasm. There appears to be a fibrous cyst wall present.



Fig. 7. M. C.—Moderately large cyst of the parotid gland excised without evidence of facial paralysis.

Case 3. L. F., female, aged seventeen, presented herself complaining of a painless swelling just below the angle of the jaw on the right side. She stated the tumor has been present for two years. She had been advised six months after onset to have the tumor removed but refused. The tumor increased in size and when first



Fig. 8. L. F.—Mixed tumor of the parotid gland removed without evidence of resulting facial paralysis.

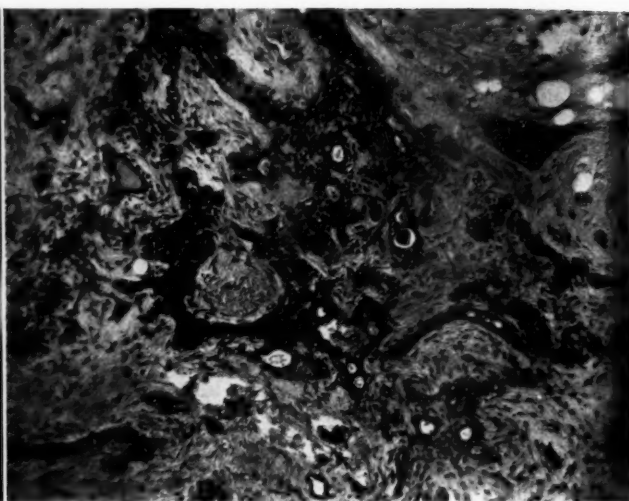


Fig. 9. Microscopically, tumor was composed of dense hyaline connective tissue stroma embedded in which are plaques of fairly well differentiated cartilage together with rather irregular cords and columns of small, deep staining epithelial cells. Mixed tumor.

seen at our clinic the tumor was the size of a lemon. On September 16, 1952, surgery was carried out under general anesthetic. There was a definite encapsulated tumor which extended from the parotid gland and was intimately adherent to the submaxillary gland. The submaxillary gland was removed along with the tumor (Fig. 8).

Pathological report: Specimen measures 4 cm. in diameter. It is firm in consistency and white in color. It has the gross appearance of malignancy. Microscopic examination shows the tumor to be composed of a dense hyaline connective tissue stroma embedded in which are plaques of fairly well differentiated cartilage together with rather irregular cords and columns of small deep staining epithelial cells. A few gland structures are formed. Diagnosis: Mixed tumor of the parotid gland (Fig. 9).

This tumor was confusing inasmuch as it seemed as much associated with the submaxillary gland as the parotid gland. Because of the type of the tumor she is being closely followed for possible recurrence.

Case 4. E. H., female, aged fifty-three, noticed a swelling in front of her right ear in August, 1952. The swelling increased in size and in November, 1952, her family doctor removed an "infected gland." The incision healed slowly and the swelling recurred. She presented herself at our clinic in June, 1953. A check was made of the pathological diagnosis in 1952 and it was found that the "infected gland" had been reported as a cylindroma and its significance not appreciated. On

June 2, 1953, using intratracheal anesthesia, the external carotid artery was ligated and complete removal of both lobes of the parotid gland was carried out. Very little difficulty was encountered in preserving the facial nerve. The convalescence has been uneventful except for a transitory facial paralysis that is rapidly disappearing (Fig. 10).

Pathological report: Tumor mass measures 6 x 4 x 3 cm. It is grayish in color and very firm in consistency. There is definite infiltration with no evidence of encapsulation. Microscopic sections of the tumor show it to be composed for the most part of solid sheaths, cords and columns of epithelial cells which are markedly undifferentiated and definitely infiltrating. In a few areas glands are formed. Definite mitotic figures are present. The picture is that of a carcinoma rather than the usual mixed tumor. Diagnosis: Cylindroma of the parotid gland (Fig. 11).

This tumor was removed successfully with preservation of the facial nerve and a close follow-up will be carried out.

Case 5. S. N., aged forty-three, complained of a painless swelling over the left parotid region of two years duration. He first noticed it while shaving and had observed a slight increase in size. A diagnosis was made of a parotid tumor and excision was carried out under local anesthesia on January 11, 1941. A well encapsulated dark bluish tumor 4 x 2 x 2 cm. was removed. At the very end of the dissection the capsule was inadvertently entered and there was a slight spillage of the granular contents of the tumor. The wound was

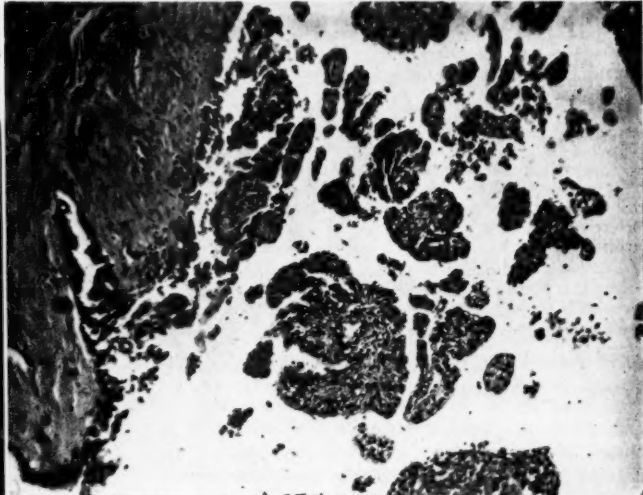
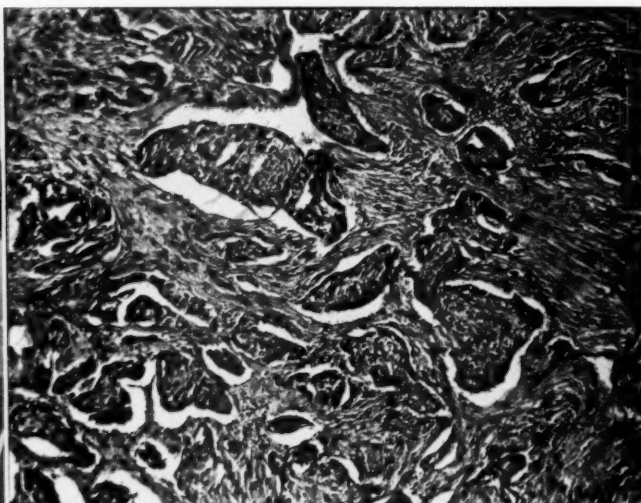


Fig. 10. (above) E. H.—Cylindroma of the parotid gland. Excision of both lobes of the parotid gland with preservation of the facial nerve. Four months post-operatively there remains a slight facial paralysis which has been rapidly improving.

Fig. 11. (above) Microscopic appearance of the cylindroma showing solid sheaths, cords and definitely infiltrating. These tumors are malignant tumors.

Fig. 12. (below) S. N.—Adenocarcinoma, grade three, removed in 1941, by local excision followed by x-ray therapy without evidence to date of recurrence. There has been no evidence of facial paralysis.

Fig. 13. (below) Microscopic appearance of adenocarcinoma of the parotid gland. This malignant tumor was reported by Dr. A. C. Broders, Mayo Clinic, as "adenocarcinoma, grade three, more malignant than the average grade three."

thoroughly irrigated with saline. The patient left the hospital after a few hours and healing was by primary union without any evidence of facial nerve impairment (Fig. 12). The tumor was reported by Dr. A. C. Broders of the Mayo Clinic as being "adenocarcinoma, grade three, more malignant than the average grade

three." X-ray therapy was given following the healing of the incision (Fig. 13).

In the light of our present knowledge this patient should have had a complete extirpation of his parotid gland with possibly a dissection of the

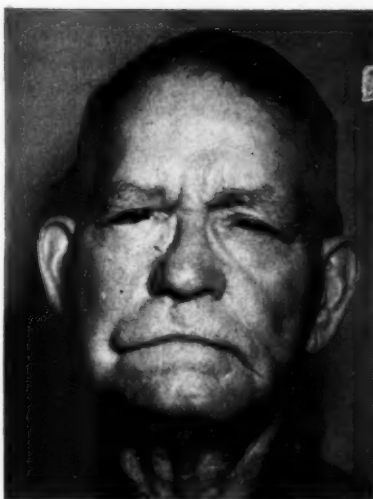


Fig. 14. H. D.—This seventy-one-year-old patient had complete removal of his parotid gland on the right side. Almost the entire gland was involved by the vascular tumor. The facial nerve was sacrificed. The facial paralysis was corrected by utilizing fascia lata from the thigh to correct the facial deformity. It is believed that this is the oldest patient ever successfully operated upon for removal of a hemangioma of the parotid gland.



Fig. 15. Microscopic appearance of cavernous hemangioma of parotid gland demonstrating the many blood spaces.

node-bearing area on the affected side. He has been observed for nearly thirteen years without evidence of recurrence.

Case 6. H. D., aged seventy-one, was first seen in February, 1947, complaining of a large swelling on the right side of his face. The swelling had been present since boyhood but had increased markedly in size during the past year. The increase in size of the swelling had been accompanied by severe pain of the lancinating type. He had been unable to sleep for several weeks. He had been seen elsewhere and a diagnosis of a hemangioma had been made and two or three injections of a sclerosing fluid had failed to alleviate his symptoms. The tumor extended from the temporal region, covered the mastoid process, and extended below the angle of the jaw. Pressure caused an increase in the pain and a diminution in the size of the tumor. A bruit could not be heard over the tumor. Because of the vascularity and size of the tumor the patient was advised that removal would probably result in sacrificing the facial nerve with resulting paralysis. This he accepted and with sufficient blood available, surgery was carried out on February 3, 1947. Under intratracheal anesthesia, the external carotid artery was ligated and the entire parotid gland was removed. Bleeding was well controlled by this method and it was not difficult to remove the entire vascular mass down to the masseter muscle.

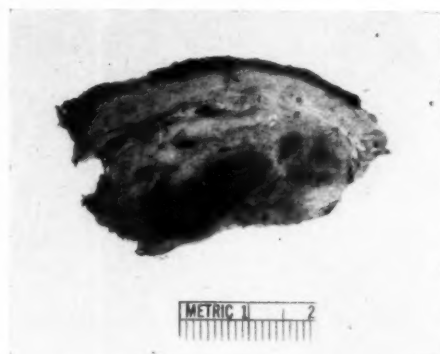


Fig. 16. Cavernous hemangioma of the parotid gland. A small portion of the tumor is shown which shows the extreme vascularity of the tumor.

Stensen's duct was ligated. His recovery was uneventful and he left the hospital on the eighth postoperative day. He had a typical facial paralysis, but was entirely free of pain.

Pathological diagnosis: Specimen consists of irregular mass of tissue 6 x 5 cm. (Fig. 16). In the center of the mass is an ovoid tumor 3 x 1½ cm. The tumor is hemorrhagic in appearance. The surrounding tissue has the gross appearance of salivary gland.

Microscopically: The tumor nodule is composed of blood spaces most of which are thromboses. The connective tissue contains many foreign body giant cells. These may be the result of sclerosing agent therapy. The whole tumor is surrounded by fairly dense connective tissue capsule. In certain regions the tumor shows cavernous blood spaces. The histological picture

is that of a cavernous hemangioma of the parotid gland (Fig. 15).

Diagnosis: Cavernous hemangioma of the parotid gland with partial thrombosis.

On September 15, 1947, strips of fascia lata were inserted under the tarsal plate, upper lip and lower jaw and the loops sutured to the temporal fascia after the method described by J. Barrett Brown. Later a canthoplasty was done and a satisfactory cosmetic result was obtained (Fig. 14).

Hemangiomas of the parotid gland are extremely rare.⁸ Those composed of larger vessels are described as capillary hemangiomas.¹³ These tumors are benign but often attain considerable size and may invade adjacent structures. They most frequently occur in infants, and often are associated with a superficial vascular nevi. Files of the Registry of Oral Pathology² contain only six such tumors in the past twenty years. After a careful search of the literature it is thought that this is the oldest patient ever successfully operated for a hemangioma of the parotid gland.

Summary

1. Parotid gland tumors are rare. The origin of many parotid tumors is not well understood.
2. Mixed tumors of the parotid tend to recur. Even eminent pathologists are inaccurate in being able to predict which ones will recur.
3. Knowledge of the anatomy of the parotid gland will facilitate removal of parotid tumors without injury to the facial nerve.
4. Benign tumors may be treated by simple enucleation. Mixed tumors should be removed by lobectomy and malignant tumors by complete extirpation of the entire gland.
5. Six cases of parotid tumors are presented. One case, a hemangioma of the parotid gland was successfully treated by complete removal of the gland with sacrifice of the facial nerve. Facial paralysis was corrected by the use of fascia lata supporting slings. This case is thought to be the oldest patient successfully treated for a hemangioma of the parotid gland.

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RECENT TRENDS IN THE SURGICAL MANAGEMENT OF INFANTILE HYDROCEPHALUS

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INFANTILE hydrocephalus (water on the brain) has intrigued and provoked physicians for many years. Most doctors in their daily practice have had some contact with this condition for it is not uncommon. Murphy found this condition to occur congenitally, with or without spina bifida, in approximately 200 children per 100,000 births. Others have indicated an even higher incidence. The literature on the diagnosis and treatment of hydrocephalus is vast, but, in general, only two main types of hydrocephalus are recognized. These two types are the obstructive and the communicating.

The first of these, obstructive hydrocephalus, in which the ventricles of the brain do not communicate with the cerebrospinal subarachnoid pathways, is most commonly associated with neoplasms of the brain, and its relief is usually obtained by direct attack on the tumor. In those cases in which the disease is not due to neoplasm, congenital atresia of the cerebral aqueduct, congenital bands, hemorrhage, infection and so forth have been described as causative agents. Relief by surgical means will be discussed later in this paper.

Communicating hydrocephalus, in which the cavities of the brain and the pathways of the subarachnoid cerebrospinal fluid are in free continuity, is usually of congenital origin, but may follow inflammation of the meninges. Since the advent of the various chemotherapeutic agents, it has become evident that among children secondary hydrocephalus due to obliteration of the basilar cisterns may be one of the unexpected complications which develops after successful treat-

ment of an acute phase of meningitis with antibiotics.

Classically the treatment of hydrocephalus in children has fallen into two categories. First, attempts have been made to reduce the total quantity of cerebrospinal fluid produced by coagulation or avulsion of the choroid plexuses of the cerebral ventricles,^{1,8,11} dehydration, repeated spinal or ventricular punctures, ligation of the carotid arteries⁹ in the neck, sympathectomy and so forth.¹⁰

The second general method for the relief of infantile hydrocephalus has been the attempt to divert the cerebrospinal fluid from its customary subarachnoid pathways to other depots. In this regard it is of interest to realize that it is relatively difficult to devise a "new" operation for the treatment of hydrocephalus, for over the years practically every body cavity or space, potential or real, has been utilized in the attempt to arrest the inexorable progression of this condition.

Spontaneous remission of severe hydrocephalus does occur and cases have been reported. In cases of severely progressive disease, however, it is hazardous to wait or hope for spontaneous remission since the disease can rapidly develop to a point where surgical intervention will not help.

The clinical appearance of the hydrocephalic child need not be described here for it is familiar to all physicians. In the first few weeks of life hydrocephalus in the early stages of development may not be easily detectable. More than one discerning doctor has found the successive routine measurements of the head on postnatal visits to be revealing.

The attempt to reduce the production of cerebrospinal fluid has, except in a few hands, been unrewarding. Diversionary operations have been common for, to all intents and purposes, the problem of the surgical treatment of infantile hydrocephalus seems a simple one. Yet over the

Read at the meeting of the Southern Minnesota Medical Association, Mankato, Minnesota, September 14, 1953.

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The opinions expressed in this publication are not necessarily those of the Department of the Air Force or Department of Defense.

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years, except for sporadic successes, most therapeutic attempts have yielded discouraging results.

The most commonly employed procedures for the relief of hydrocephalus resulting from an obstruction of the ventricular pathways (obstructive hydrocephalus), except direct attack on a neoplasm, have been third ventriculostomy, that is, the establishment of a communication between the third ventricle of the brain and the basal subarachnoid cisterns,¹² and detour operations. In the detour operations the cerebrospinal fluid has been routed from the lateral ventricles in the brain to the cisterna magna in the posterior cranial fossa¹⁴ (Fig. 1), to the mastoid antrum⁷ (Fig. 2), to the pleural⁴ or peritoneal cavities⁹ (Fig. 3), or to the ureter after removal of the ipsilateral kidney.

For communicating types of hydrocephalus in which diagnostic ventriculography, dye tests and encephalography demonstrated free communica-



Fig. 1. Ventriculocisternal shunt.

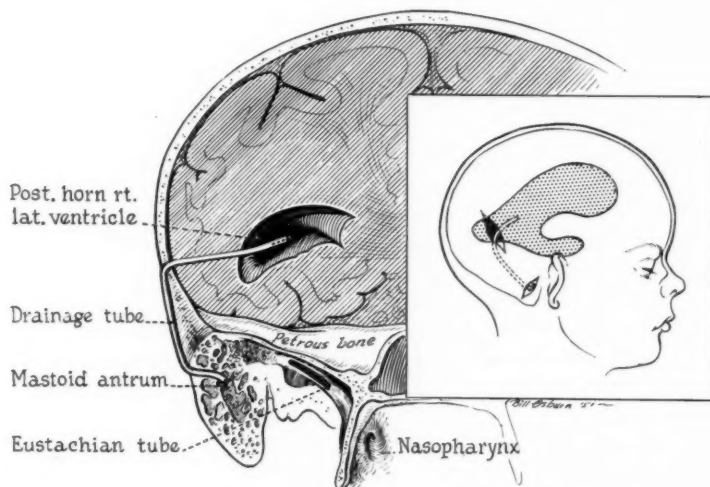


Fig. 2. Ventriculomastoid shunt, modified from Nosik. (From Svien, H. J., Dodge, H. W., Jr., and Lake, C. F.: Ventriculomastoid Shunt in the Management of Obstruction to the Aqueduct of Sylvius in the Adult: Report of Case. *Proc. Staff Meet., Mayo Clin.*, 27:215-218 [May 21] 1952.)

tion between the ventricular system and the cerebrospinal subarachnoid pathways, the same ventricular short circuits to extra-nervous depots have been employed, or other methods of diversion were devised from the spinal subarachnoid space to the subcutaneous tissues of the back (Seton)¹³ (Fig. 4), vertebral body,¹⁶ retrohepatic space, omental bursa (Fig. 5a), peritoneal cavity,^{2,5,13}

and ureters (Fig. 5b). This is done because although the ventricles and subarachnoid spaces are in free communication, the cerebrospinal fluid does not seem to be adequately absorbed or to gain egress from the nervous system.

Although the large majority of these procedures has been tried in the past with only meager reward, recently a combination of factors has re-

sulted in renewed interest in the treatment for hydrocephalus and an awakening of effort has occurred.

Since the last great war improved surgical

group of patients having progressive hydrocephalus. Many infants having subdural hematomas, and some infants having certain types of brain tumors or congenital cysts may be spectacularly

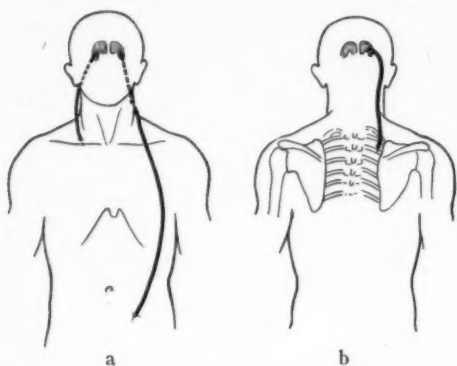


Fig. 3. (a) Ventriculopleural shunt (through the supraclavicular space), and ventriculoperitoneal shunt; (b) ventriculopleural shunt (through the second intercostal space posteriorly).

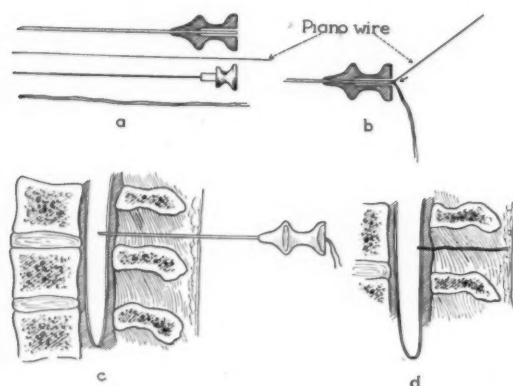


Fig. 4. Seton procedure: (a) Seton needle with stylet and knotted silk string; (b) method of inserting silk; (c) needle and knotted silk in place in the subarachnoid space; (d) knotted silk in place in the subarachnoid space and subcutaneous tissues after withdrawal of needle.

techniques, new materials (such as plastics), a wider therapeutic spectrum for antibiotics, more adequate anesthesia for children, regulation of blood and electrolytes, and more enlightened nursing and supportive care have encouraged renewed surgical effort.

The increasingly wide cognizance that progressive enlargement of the head in the first year of life can be due to brain tumor or subdural hematoma, has tended to remove many patients having these conditions from the large indeterminate

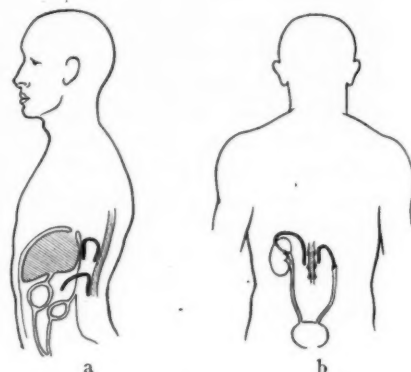


Fig. 5. (a) Subarachnoid retrohepatic shunt (above) and shunt from subarachnoid space to the lesser omental bursa (below). (b) Subarachnoid reno-ureteral shunt (experimental) (left) and subarachnoid ureteral shunt (right).

salvaged by early recognition and surgical treatment.

An occasional case such as the one reported herein may serve to spur surgeon and clinician alike to greater diagnostic accuracy when confronted with progressive enlargement of the head of unknown etiology. This case is only one example of why these children need to be carefully studied as to the cause of their rapidly enlarging heads.

Report of Case

A baby boy, two months of age, was admitted to the Mayo Clinic because of rapid enlargement of the head since birth. His mother had not suffered any illness during pregnancy. The infant was delivered without instruments after two hours of labor. At birth the circumference of the head was 35 cm. On routine checkup at one month the circumference of the head was 40.5 cm., and at two months it was 45.5 cm. Development had been normal in all other respects up to the time of the child's admission.

Examination showed that the fontanel was bulging and that the cranial sutures were separated. Roentgenograms of the skull confirmed these findings. Bilateral puncture of the fontanel did not reveal subdural hematoma. Results of dye studies were indeterminate. Ventriculography revealed marked thinning of brain substance, but air could not be seen in the third or fourth ventricle. The infant was taken home and returned in one month, during which time the head had enlarged 4 cm.

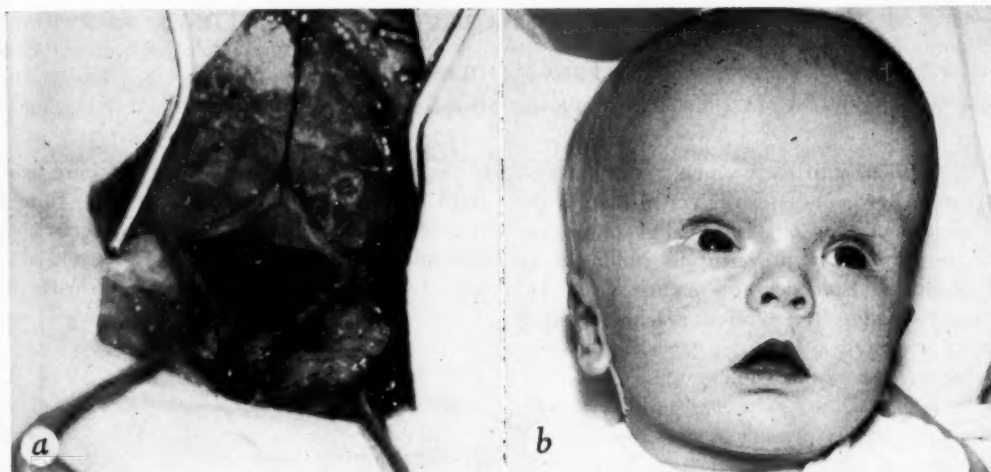


Fig. 6. (a) Suboccipital craniectomy showing a congenial cyst blocking the fourth ventricle. (b) View of patient after operation.

Suboccipital craniectomy was performed at this time and a cyst was encountered over the fourth ventricle (Fig. 6a). This proved to be the dilated roof of the fourth ventricle, the foramina of Luschka and Magendie being absent. The fourth ventricle was then unroofed, allowing free communication between the ventricular and subarachnoid spaces. During the postoperative hospital stay, the fontanel remained soft (Fig. 6b).

The last report from the infant's home physician, nine months after operation, indicated that the patient's head had grown at a normal rate for his size and age, and that his general health was good.

Realization that a number of hydrocephalic infants have other anomalies of the nervous system which most probably will not be cured or even ameliorated by relief of intracranial pressure, has tended to lessen the harsh judgment of operative procedures designed to relieve hydrocephalus. When the final analysis of results is considered and made, surgeons should be more willing to modify the "all or none" dictum and should be satisfied with relief of progressive pressure, regardless of whether the success is great or small.

Moreover, the feeling has become more prevalent regarding these pressure-relieving operations, that they are not considered as "cures" *per se*, but that they allow relief from progressive pressure until some sort of spontaneous cerebral compensation can occur. Such a philosophy promotes rather than discourages attempts at therapy.

Unfortunately it is not difficult to predict the clinical result in the case of an unattended in-

fant having severely progressive hydrocephalus; most usually it is disastrous. However, after relief from pressure has been obtained, despite the severity of pre-existing damage, it is often exceedingly difficult to foresee the eventual result. One may be very agreeably surprised when a child with moderate damage to the brain is spared the inexorable march of hydrocephalus and proves in later life to be a relatively useful member of the community.

So, while there are seemingly few "new" operations for the relief of the patient having hydrocephalus, recent trends relative to technique, material, diagnosis and thinking on the subject should result in concentrated diagnostic and therapeutic effort, if possible, for each infant afflicted with progressive enlargement of the head rather than abandonment of the patient to the pitiful group of incurable progressive hydrocephalics.

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CONDITIONS MISTAKEN FOR LEUKEMIA IN CHILDREN

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THE familiarity of the lay public with medical terms is nowhere better illustrated than in the case of leukemia, as this is a malignant disease which is particularly prevalent in childhood as well as in the later decades of life (Fig. 1). Many of its victims have received much newspaper publicity which always arouses concern and sympathy among the reading public. Since leukemia is universally fatal, it is important to be certain of the diagnosis before causing parents to suffer the severe anxiety that accompanies the pronouncement of such a disease in their child. A further reason for accurate diagnosis is that the treatment of leukemia, unsatisfactory as it is in saving life, is most effective in alleviating symptoms when begun early in the course of the illness.

There is increasing evidence that the incidence of leukemia is on the upgrade in all age groups. This seems to be true even when allowance is made for the increase that is attributable to better methods of detection and to awareness of the possibility of the disease on the part of both physicians and the public.

It should be pointed out in this connection that with the continued and drastic reduction in childhood mortality from infections there has been a radical change in the relative importance of deaths from cancer as a whole among children. Data published in 1949 for children insured in one large life insurance company² show that cancer, including leukemia and Hodgkin's disease, is now second only to accidents as the ranking cause of death in the age group one to fourteen years inclusive and leads all other diseases in the age group five to nine years. These data also indicate that leukemia is the most common type of fatal cancer in children—that it accounts for nearly half of the deaths from cancer in the age group one to four years inclusive, for a little more than two-fifths

in the age group five to nine and for more than a third in the age group ten to fourteen. In addition, these data disclose that there has been a significant increase in deaths from leukemia at all ages from one to fourteen years inclusive but

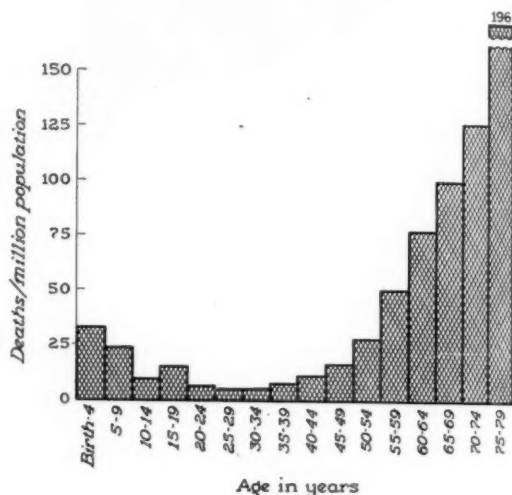


Fig. 1. Age incidence at death from lymphatic leukemia in the white male population of the United States for the year 1949. (Reproduced with permission from: Gilliam, A. G.: Age, sex, and race selection at death from leukemia and the lymphomas. *Blood*, 8:693-702 (Aug.) 1953.

especially in the age group five to nine years when the period 1943 to 1947 inclusive is compared with the period 1930 to 1934 inclusive.

Sachs and Seeman³ in a statistical study showed that in the period from 1931 to 1940 there was an over-all increase of 60.9 per cent in mortality from leukemia. In the age group under one year the increase was 75.7 per cent; in the age group one to four years, 55.2 per cent; and in the age group five to fourteen years, 46.1 per cent.

Gilliam,¹ in the most recently available study, has shown that the incidence of lymphatic leukemia in children less than five years of age is greater than at any age up to fifty-five years.

Acute leukemia should be suspected in a child who has been ill for some time with fever, anemia

Read at the Clinical Session of the American Medical Association, St. Louis, Missouri, December 1 to 4, 1953.

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LEUKEMIA IN CHILDREN—MILLS

and enlargement of the liver, spleen and lymph nodes and who may have purpura or bleeding manifestations and leukocytosis with an increase in lymphocytes, many of which may be immature

which conditions are most likely to be mistaken for leukemia. For information on this point, I have viewed the records of forty-four children who were seen at the Mayo Clinic in the years

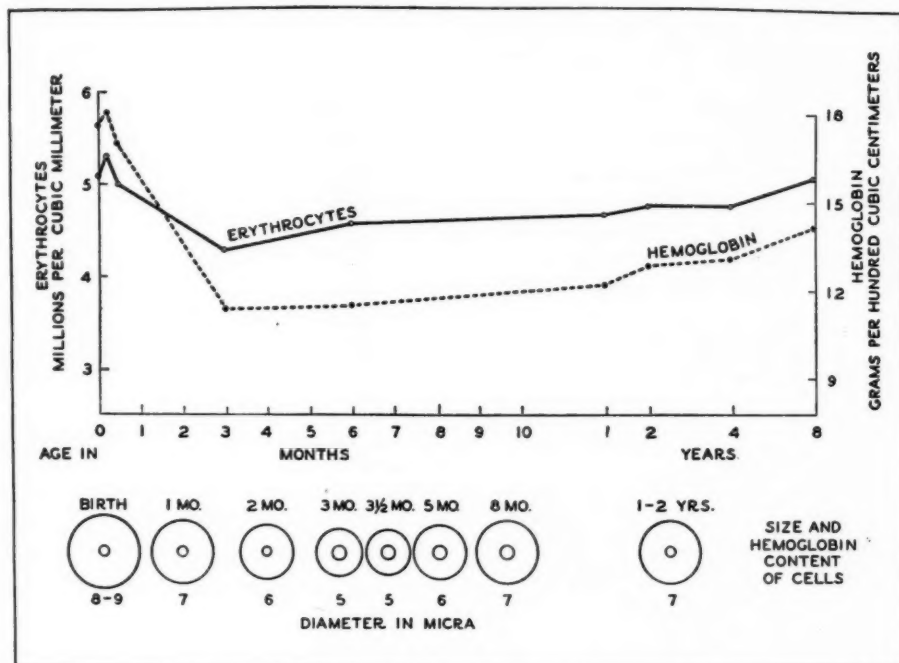


Fig. 2. Normal values for erythrocytes and hemoglobin at various ages in childhood. (Reproduced with permission from: Blackfan, K. D. and Diamond, L. K.: *Atlas of the Blood in Children*. Page 9. New York: The Commonwealth Fund, 1944.)

in development. In such cases, however, only careful examination of all the formed elements of the blood as to their quantity and quality may eventually afford the answer, and at times it will be necessary to examine the site of formation of the blood, namely the bone marrow, to arrive at a diagnosis that is not apparent from a study of the peripheral blood. Furthermore, one must remember that the blood of small children reacts with greater lability than that of adults and that the normal values for the various formed elements of the blood differ from those of older patients (Figs. 2, 3 and 4). The variability in the number and type of leukocytes in young children must be taken into account when a child is suspected of having leukemia.

Because of the importance of an accurate diagnosis when the question of leukemia in a child has been raised, it seemed worth while to determine

1949 to 1952 inclusive and who were suspected of having this disease but who, in every instance, were proved to have some other condition that was responsible for the findings suggestive of leukemia. All but four of this group of children were less than five years of age and most were two years of age or less.

By grouping the conditions which were present in the forty-four patients suspected of having acute leukemia, it was found that the great majority had an acute infection to which their blood reacted with an unusual increase in total leukocytes or lymphocytes or both (Fig. 5). This is the so-called leukemoid reaction which is familiar to the hematologist and the internist and which occurs in response to certain infections, intoxications, malignant disease with metastasis to bone, and severe hemorrhage. It is well known that pertussis may cause a high leukocyte count with

a predominance of lymphocytes, and this infection was found to be the basis of the disturbance in four children, all less than a year of age, one child having 130,000 leukocytes per cubic

Two children had an interesting condition, described by Smith⁴ and called by him "acute benign lymphocytosis," which was characterized by elevated leukocyte and lymphocyte counts without

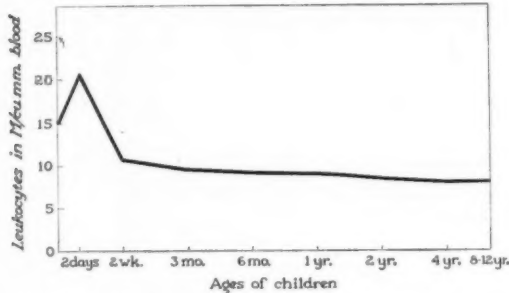


Fig. 3. Normal values for total leukocytes at various ages in childhood. (Reproduced with permission from: Blackfan, K. D. and Diamond, L. K.: *Atlas of the Blood in Children*, page 8, New York, The Commonwealth Fund, 1944.)

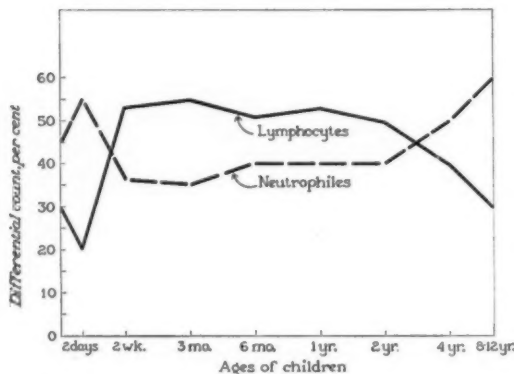


Fig. 4. Normal differential counts for neutrophils and lymphocytes at various ages in childhood. (Reproduced with permission from: Blackfan, K. D. and Diamond, L. K.: *Atlas of the Blood in Children*, page 8, New York, The Commonwealth Fund, 1944.)

millimeter of blood of which 80 per cent were lymphocytes of immature types. Others in this group had infections of the respiratory, intestinal and urinary tracts or evidence of sepsis. Five children were proved to be suffering from infectious mononucleosis which is assumed to be of viral origin and may easily be confused with leukemia because of the enlarged liver, spleen and lymph nodes and because of the lymphocytic increase in the blood. Careful study of the peripheral blood smear for atypical lymphocytes of Downey and the presence of a high heterophil titer established the true diagnosis in these cases.

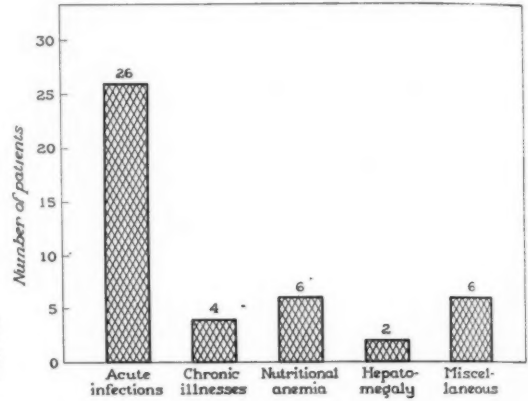


Fig. 5. Conditions which simulated leukemia in 44 children seen at the Mayo Clinic in the period 1949 through 1952.

immaturity of the latter type of cell. Both of these patients recovered.

Four children had chronic illnesses which caused reactions in their blood suggestive of leukemia. One of these children had rheumatoid arthritis, one had infantile cortical hyperostosis and the other two had chronic disorders of the skin, namely, eczema and urticaria pigmentosa respectively, which were secondarily infected.

Six children less than eighteen months of age had anemia classified as nutritional since their diets lacked the ingredients deemed essential in building blood successfully; all responded to improvements in their diets. All habitually drank milk to the exclusion of meat, eggs, cereals, vegetables and fruits. Two children with enlarged livers were found to have a hepatoma and a granuloma of the liver, respectively, but they did not have leukemia.

In the group of children with miscellaneous conditions were a sixteen-month-old child with acquired hemolytic anemia, a two-year-old child with bleeding from the bowel, a two and one-half-year-old girl with a granulocytopenia and relative lymphocytosis resulting from the toxic reaction to an antibiotic drug, a five-year-old boy whose mother feared leukemia because he bled from the site of a penicillin injection, and an eleven-year-

old girl with a brain tumor. None of these proved to have leukemia.

In addition to the diseases encountered in this series of forty-four cases, there are other conditions which may be mistaken for leukemia in children. These include (1) the collagen diseases such as rheumatic fever, and infections such as typhoid fever, osteomyelitis, congenital syphilis, viral hepatitis and other viral diseases, and fungous infections; (2) malignant neoplasms, such as neuroblastoma, with metastasis to bone; and (3) intoxications such as poisoning from heavy metals.

It is not always possible to make a definite diagnosis in all children who are suspected of having leukemia. This is illustrated in the case of an eighteen-month-old boy who was referred for examination because leukemia was suspected but who was not in this series of forty-four patients. Repeated examinations of this child's blood and bone marrow failed to disclose the true nature of his disorder, yet he died of leukemia three years later. It must be emphasized that only continued observation and repeated examination of the blood will disclose the nature of the disease in most instances.

Conclusions

When confronted with a very young child suspected of having leukemia because of anemia, enlargement of the liver, spleen and lymph nodes, purpuric manifestations, and abnormal increase of the leukocyte and lymphocyte counts with or without immaturity of the latter cells, one must be exceedingly cautious in making a diagnosis of leukemia because of the extreme lability of the blood of young children in response to certain acute or chronic illnesses, intoxications, malignant diseases, and severe hemorrhage. Careful and continued study of the peripheral blood and bone marrow should enable one to exclude the diagnosis of leukemia when the child actually has some other disease.

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DEATHS FROM PEPTIC ULCER IN MINNESOTA DURING 1952

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DURING the month of September, 1952, a seventy-two-year-old farmer went ninety miles up the North Shore of Lake Superior for a "fast." During the next nine days he ate nothing and drank only water and alcohol. On September 20, he was brought in to a hospital suffering from a perforated duodenal ulcer which had manifested itself twenty-four hours previously. He was moribund on admission to the hospital and died before an adequate examination could be performed.

Perhaps at the other extreme is the story of a seventy-seven-year-old man with cancer of the lung. While he was in the hospital for diagnosis during August, 1952, it was decided that the tumor was inoperable, but before he could be discharged, a serious hemorrhage from a gastric ulcer occurred. He was subjected to an emergency gastric resection during which a large hepatic metastasis was found. He died on the tenth postoperative day from general debility arising from the operation and pulmonary carcinoma.

Between these extremes lie the remaining ulcer deaths in Minnesota for the year 1952. Most of them are far less exciting in their circumstances but it was with a view toward analyzing all of these deaths in order to gain any useful information that they may supply that this study was done.

Source of Information Concerning the Ulcer Deaths

A list of patients probably dying of peptic ulcer in 1952 was obtained from the State of Minnesota Department of Vital Statistics.² This basic source of information was supplemented by questionnaires sent out to the attending physicians. One half of the patients were from the Twin City area and the other half were from the remainder of the state. In addition, the records of Minneapolis General Hospital and Ancker Hos-

TABLE I. CLASSIFICATION OF DEATHS ACCORDING TO TYPE OF COMPLICATION

Hemorrhage	59	(46%)
Perforation	36	(28%)
Perforation with hemorrhage	7	(5.5%)
Obstruction	17	(13%)
After elective surgery	10	(8%)
Total	129	(100%)

pital were combed for information which some attending physicians in the Twin City area could not furnish. This was done because of the possibility that many of these patients may have been seen at some time in these institutions on an emergency basis during a bleeding episode. Many local physicians were also reached for information by telephone.

From the Department of Vital Statistics an original list of 143 patients who may have died as a result of peptic ulceration was drawn up. On further investigation eleven of these were found to have died of other causes and three patients were in the doubtful category. Consequently in the final analysis, 129 people died from complications of peptic ulcer in this state in 1952. Two of these had advanced carcinoma, one of the lung and the other of the larynx. If allowance is made for these two, then only 127 patients would have survived the year had they not had ulcers.

We have supplemented the information obtained from the Department of Vital Statistics in 119 of these 129 patients. The remaining ten are lost to followup. Seventy of these 129 patients had other significant although not necessarily fatal diseases excluding the two with cancer. These were for the most part arteriosclerosis in one form or another, diabetes, or emphysema. While a few had serious heart disease and were in failure at the time of their complication, they are listed as ulcer deaths.

Causes of Death

Table I shows a breakdown of the deaths into various categories. It is not surprising to see that hemorrhage heads the list. The prominence of

Supported by the Austen S. Cargill and the Augustus L. Searle Fund for Surgical Research.

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DEATHS FROM PEPTIC ULCER—CASEY

TABLE II. CLASSIFICATION OF DEATHS ACCORDING TO AGE, SEX, AND LOCATION

Age	Average age 65 years (youngest 32 years, oldest 89 years)
Sex	102 males and 27 females
Location	78 duodenal
	32 gastric
	3 combined
	16 unknown
	129 total

TABLE III. CIRCUMSTANCES SURROUNDING DEATH IN 95 OUT OF THE 102 CASES OF HEMORRHAGE AND PERFORATION

Complication	Well Attended by a Physician During Final Episode	Moribund When First Seen	Dead When Seen	Percent Died Without Care
Hemorrhage	48	3	4	13%
Perforation	32	2	0	5.7%
Perforation with Hemorrhage	6	0	0	0%
	86	5	4	9.5%

peptic ulcer as an important cause of death is due mainly to this complication.⁴ However, that perforation should follow so closely with 28 per cent of the total, appears unusual in that it is generally felt that the mortality rate for perforation has decreased markedly since the advent of antibiotics. Our mortality rate in this clinic for perforation is 6.4 per cent in cases handled since 1942, with no deaths during the last five years. Perhaps this very reliance on the antimicrobial agents accounts in part for the many deaths from perforation in that today there is a greater tendency to handle this catastrophe without surgery. The non-operative treatment of perforated ulcers utilizing constant gastric suction was abandoned in this clinic in 1935⁵ except for early small perforations without pneumoperitoneum or the "forme fruste" type in which a perforation closes over shortly after the onset of pain. The patient with this latter type is often clinically well when first seen but has a small pneumoperitoneum demonstrable on x-ray. The non-operative treatment of large perforations with much free air in the peritoneal cavity and great peritoneal contamination from food carries a very high mortality rate. With safer gastric resection now common, one would also expect to see the deaths from obstruction decline.

TABLE IV. PEPTIC ULCER FATALITIES OCCURRING AFTER STRESS SITUATIONS IN THE 102 CASES OF FATAL HEMORRHAGE, PERFORATION, OR BOTH

	Hemorrhage	Perforation	Perforation with Hemorrhage
Asthma, spontaneous pneumothorax, or Cor pulmonale in failure	3	2	0
Congestive heart failure	1	3	1
Poliomyelitis	1	0	0
Recent fracture	1	1	0
Meningitis	1	0	0
Cerebral Vasc. Accident	1	0	0
Peritonitis	1	0	0
Total Incidence	9 (16%)	6 (17%)	1 (14.3%)

Age, Sex, and Location of the Ulcers

Table II bears out the well known facts that peptic ulcer deaths are more common in elderly individuals and that it is a more frequent disease in males. All types of complications follow this general pattern concerning age, sex, and location except that the average age in the obstructed group was sixty-eight years and that all ulcers in this class were duodenal. The average age of those dying after elective surgery was fifty-four years.

Conditions Surrounding the Management at the Time of Death

One frequently hears of people experiencing fatal upper intestinal hemorrhages or perforations in remote areas far from medical attention. What risk is involved for such catastrophes in people with peptic ulcer symptoms? Out of 102 cases of death due to hemorrhage, perforation, or a combination of the two, information concerning the exact nature of demise was obtained in ninety-five instances. (Table III) Five patients were moribund on admission to a hospital or when they were first placed in a physician's care, and four died before medical aid reached them, a percentage of 9.5 per cent. Typical histories here include patients who never consulted a physician at any time, bleeding while driving an automobile, and the tragic case of the patient who bled to death while receiving a transfusion in an ambulance on the way to a hospital for emergency surgery. At least six of these nine casualties had a history of epigastric distress for some years before the final incident and two had had previous hemorrhages.

DEATHS FROM PEPTIC ULCER—CASEY

TABLE V. PREVIOUS COMPLICATIONS 111 OUT OF 129 CASES

Hemorrhage	23
Perforation	10
Esophagitis with obstruction	1

Stress and Peptic Ulcer

That stress situations may activate a dormant peptic ulcer or instigate conditions leading to acute ulceration is well known. Sixteen fatal hemorrhages or perforations occurred after the development of stress situations. (Table IV). Asthma and allied respiratory crises appear to be particularly serious offenders. Cortisone may have been instrumental in two of these, and in two of the nonrespiratory induced situations, renal insufficiency and the bleeding tendency which often accompanies it may have played some part. Four of the sixteen had a definite ulcer history, seven had no past history, and this factor is unknown in the other five.

Past History of Peptic Ulcer

As one can see in Table V, over $\frac{2}{3}$ of the 111 cases in which full information is available, died as a result of their first complication. Of the thirty-four patients with a history of hemorrhage or perforation, the majority had only one episode of one or the other in the past. None of the ulcer victims had a modern gastrectomy before the final episode; however, eight out of 120 patients did have some previous gastric surgery as follows: six had earlier perforations closed, one had a gastrojejunostomy, and one had a 50 per cent gastric resection. No one in the entire series had a vagotomy.

The majority of patients had some warning that a fatal accident might happen in that ninety-two of the 114 cases in which full information is at hand had a history of ulcer distress. There does not seem to be any correlation between the duration of ulcer symptoms and the severity of the ulcer diathesis. Many patients had histories of ten to twenty years' duration without any significant difficulties only to have a fatal complication occur in 1952, while at least twenty-two patients had no previous symptoms.

The next part of this paper will deal with each group of complications individually, as follows: (1) deaths due to hemorrhage, (2) perforation, (3) perforation with hemorrhage, (4) obstruc-

TABLE VI. HISTORY OF ULCER IN 114 OUT OF 129 CASES

No previous history	22
History of less than 1 year	21
History of greater than 1 year	71

TABLE VII. TREATMENT OF THE FINAL EPISODE IN PATIENTS DYING OF HEMORRHAGE

Treated conservatively—Had serious associated disease	14
Died without medical care	7
Treated conservatively—No associated disease A	19
Treated conservatively B	2
Surgery emergency	14
Unknown	3
	59 total

tion, and (5) deaths after elective surgery for peptic ulcer.

Hemorrhage

In the fifty-nine cases of hemorrhage supplemental information was obtained in fifty-six instances. The average age at the time of death, sex, and location of the ulcer are typical of the entire series of 129 patients. (Table II).

As regards a history of peptic ulcer, nine out of fifty-two patients had no previous history before their final episode and thirteen had a history of less than one year. Eighteen out of fifty patients had the previous complication of hemorrhage, usually only one episode, and two had previous perforations. It is interesting to note that fourteen of these twenty who had serious difficulty with the ulcer diathesis in the past were in good health otherwise and consequently could be considered candidates for earlier elective operations which may have been lifesaving.

Table VII illustrates the treatment of the final episode in fifty-six out of the fifty-nine patients with hemorrhage. Fourteen patients who had serious associated disease were treated conservatively. These include very advanced age with generalized arteriosclerosis, serious heart disease, respiratory insufficiency, and peritonitis. The seven who died without medical care were in remote locations when the hemorrhage started or else exsanguinated so rapidly when they were admitted to a hospital that nothing could be done. Nineteen patients with no serious constitutional disease that would have contraindicated surgery were treated with transfusions alone. Another

DEATHS FROM PEPTIC ULCER—CASEY

TABLE VIII. TREATMENT OF THE PERFORATION IN 31 OUT OF 36 PATIENTS

No Surgical Closure	
Those with serious disease which precluded surgery	6
No medical treatment during final illness	3
No associated serious disease which would preclude surgery	12
	21
Surgical Closure	10

two patients who were otherwise healthy did not have surgery but are placed in a separate category because one was undiagnosed and the other did not receive the usual treatment for a bleeding ulcer. Altogether there were ten patients who received no transfusions, too few transfusions, or were misdiagnosed, exclusive of those who died without medical care. This is not at all surprising since the problem of transfusion therapy for bleeding ulcer is often guided by intuition, blood volume studies being not yet generally accessible to assist greatly in this problem.

Fourteen patients died as a result of emergency surgery. Thirteen had a gastric resection and one had a gastrojejunostomy. Heart failure accounted for four of these and technical defects and postoperative complications for the other ten.

Perforation

Again the age, sex, and location of the ulcer in this group is characteristic for all of the deaths no matter what the complication. Information concerning the past history was obtained in thirty-one out of the thirty-six cases of perforation. Eleven of these had no previous history and four had a history of less than one year. Only five people out of the twenty-nine in which the complete history is known had a previous complication. One of these had a hemorrhage in the past, three had perforations, and one had esophagitis with stricture.

While twenty-four out of thirty-six patients in this group had other associated disease, only one was really doomed as he had cancer of the larynx with metastases. Table VIII classifies the treatment of the perforation in thirty-one out of thirty-six cases. Twenty patients died without surgical intervention (this does not mean that they were necessarily handled by the gastric suction technique), but six of these had serious associated disease which precluded surgery such as heart failure, or great debility. Three died rapid-

ly after perforation before anything could be done or were in remote areas away from medical aid. However, twelve of the twenty-one conservatively handled patients probably could have tolerated surgery. Some of the other cases were not diagnosed until post mortem examination. Some such failures in diagnosis are probably unavoidable. Ten patients had surgical closures of the perforations but died in the immediate postoperative period.

Hemorrhage with Perforation

Seven people died with both hemorrhage and perforation. Only one of these had a previous complication, that of hemorrhage.

Information concerning the treatment of the final episode is known in six out of seven cases. The seventh patient had had hemorrhages in the past but circumstances surrounding her final outcome other than that she died as a result of perforation with hemorrhage in 1952 are unknown. Two of the six were subjected to gastric resection as an emergency measure and both of these continued to bleed during and after the operation and died soon in the postoperative period. Of the four who were managed conservatively, one was in an extremely debilitated condition, one was a rather irascible individual who had his own ideas about ulcer therapy, and there was no ante mortem diagnosis in the third case. The fourth patient was an eighty-two-year-old lady with a gastric ulcer of four years duration but had no other significant disease.

Obstruction

Seventeen patients died from obstruction as a complication of peptic ulcer. All ulcers were duodenal. The average age was sixty-eight years.

Nine out of the seventeen cases had associated disease—mainly arteriosclerotic degenerative in nature. Only three out of fourteen had previous complications; these were perforations. The history of the ulcer diathesis is longer in this group as one would expect. Fifteen out of the seventeen cases had a history going back over one year, and six of these of over ten years duration.

As regards the treatment of the obstruction, eight had gastric resections, and one had a gastrojejunostomy. Four of these died from factors probably attributable to errors in surgical tech-

DEATHS FROM PEPTIC ULCER—CASEY

TABLE IX. TREATMENT OF THE FINAL EPISODE IN THOSE DYING OF OBSTRUCTION

Surgery	9
Conservative	
No medical care until extremis	2
Medical management	5
Unknown	1
	17 total

nique resulting in leakage of the duodenal closure or pancreatic fistulas. Seven had no surgical intervention. (Table IX). Two of these had no regular doctor and were in extremis when first seen. The other five were considered too old for surgery. Their average age was seventy-seven years and two of them had advanced arteriosclerotic vascular disease. The final outcome is unknown in the seventeenth case.

Deaths from Elective Surgery

Ten patients died as a result of elective operations. The average age was fifty-four years. Five out of nine had previous hemorrhage or perforation, and all had a history of peptic ulcer going as far back as twenty-eight years in one case. Gastric resection was the operation performed for all of these cases. All deaths in this group were due to technical factors except for one fatality due to aspiration pneumonia.

Treatment of Final Episode in All Deaths

Table X summarizes the final treatment in 119 out of the 129 cases. The four patients listed under "Treated Conservatively (B)" were either diagnostic problems or were managed in ways other than the usual methods for hemorrhage or perforation. If the mortality rate from peptic ulcer is to be reduced, it seems to be obvious that the large group of patients treated conservatively who had no associated disease which would contraindicate surgery would be a major target for more aggressive management. Early surgery in these cases may have been life saving.

It is also apparent that the deaths resulting from surgical intervention could be decreased. In this series thirty-three gastric resections and two gastrojejunostomies were performed for the final episode. The cause of death in sixteen cases was either a leaking anastomosis or duodenal stump and occasionally pancreatitis. Intraperitoneal abscesses made up a large percentage of

TABLE X. TREATMENT OF THE FINAL EPISODE OF ALL DEATHS 119 OUT OF 129 CASES

Treated conservatively—Had serious associated disease or very old	24 (20%)
Died without care	11 (9%)
Treated conservatively (A)—No associated disease	35 (29%)
Treated conservatively (B)	4 (3.4%)
Surgery	
Emergency	35 (30%)
Elective	10 (8%)

the other nineteen cases, while failure to control a bleeding ulcer during and after surgery was a significant factor in at least three cases. The tubular gastric resection for duodenal ulcers as advocated by Wangenstein⁶ eliminates the difficulties frequently encountered in closing the duodenal stump in older operations.

Comment

It is well known that the complications of peptic ulcer are more serious in the older age group. The average age in this study was sixty-five years. In many cases in this report it appeared as though the elderly individual was eking out a hazardous existence when suddenly at a most inopportune time a dormant ulcer would perforate or bleed. Perhaps one should enlarge the indications for elective subtotal gastrectomy in the older age groups. According to Cole¹ the mortality rate for such procedures in patients over the age of sixty is actually less than when resection is performed for patients under sixty years of age, with an overall mortality rate of 1.1 per cent. He stresses that as long as there are no serious associated diseases this operation can be done safely in elderly individuals but that emergency operations are tolerated only about one third as well.

Of the 102 persons who died of hemorrhage or perforation in Minnesota during 1952, twenty-five had previous hemorrhages or perforations and one had esophagitis with stricture. There were no serious constitutional diseases or factors in sixteen of these twenty-five which would have made elective surgery dangerous other than age (the average age was 68.8 years at the time of death). Potter et al² report a mortality rate of 1.62 per cent for elective gastric resection in patients over fifty years of age. Fifty-seven per cent of all their patients had associated constitutional disease. Five out of the seven patients who died of duodenal obstruction without surgical intervention died because they were considered

DEATHS FROM PEPTIC ULCER—CASEY

too old to be operated upon. Admittedly, two of these had advanced degenerative disease.

Summary

1. One hundred and twenty-nine patients died as a result of complications of peptic ulcer in the state of Minnesota during the year 1952.

2. The incidence of fatal complications of peptic ulcer in the older age group is again shown.

3. Seventy-seven patients out of 111 died as a result of their first episode of bleeding, perforation, or obstruction.

4. No case is recorded in this series of 129 patients of any deaths which had an elective modern type gastric resection before the final episode of bleeding, perforation, or obstruction.

5. Stress appeared to be a factor in at least 16 or 16 per cent of the 102 cases of hemorrhage and perforation.

6. In an analysis of 119 of the 129 deaths, forty-five were treated surgically and seventy-four medically. Thirty-five of the latter group had no associated disease which would have contraindicated emergency surgery.

7. Technical factors appear to account for most of the surgical deaths.

8. About one out of ten people with a history of peptic ulcer distress who ultimately die of hemorrhage or perforation experience this fatal complication in situations remote from medical aid.

9. Duration of symptoms is not correlated with the severity of the ulcer diathesis as a cause of death.

Addendum

Gratitude is expressed to the Minnesota Department of Vital Statistics, and to the many physicians who contributed to this data, to the record room staffs of the Minneapolis General Hospital, Veterans Administration Hospital, Minneapolis, and Ancker Hospital for the help they have given to this study.

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MANUAL ON REHABILITATION CENTERS

The first authoritative manual of information on the nation's rehabilitation centers has been published by the National Society for Crippled Children and Adults, the Easter Seal Society, according to Lawrence J. Linck, executive director.

"Rehabilitation Centers in the United States," one of the most useful recent publications in the field of service for the crippled, grew out of the First National Conference on Rehabilitation Centers jointly sponsored by the National Society and the Office of Vocational Rehabilitation of the U. S. Department of Health, Education, and Welfare.

The booklet was compiled by Henry Redkey, con-

sultant on rehabilitation centers for the federal department.

All of the centers listed participated in the Conference, which was held December, 1952, in Indianapolis, Ind., under the joint sponsorship of the federal department and the National Society. Chosen as representative of all U. S. centers, they are divided into six groups including teaching and research, hospital and medical school operated, community with beds, community outpatient, insurance, and vocational rehabilitation centers.

The volume contains descriptions and statistics on every phase of rehabilitation procedure. It is available at \$1.50 per copy from the headquarters of the National Society, 11 South La Salle Street, Chicago 3, Illinois.

PSYCHIATRIC ASPECTS OF TUBERCULOSIS

IRVING C. BERNSTEIN, M.D., M.S. (Psychiatry)

Minneapolis, Minnesota

THE IMPORTANCE of emotional factors in tuberculosis has been mentioned by authors since the early days of medical writing. The Hindus² as early as 1500 B. C. recognized tuberculosis as a disease entity and stressed the importance of overexertion, sexual excesses, fasting, and grief in the development of tuberculosis. Other notable figures in medicine of the past who wrote of the close relationship between tuberculosis and emotions include Hippocrates and Galen.² The relatively modern literature includes many articles relating to emotional factors in tuberculosis. Trudeau⁹ implied its importance when he said that the attitude of the physician "is at once reflected to the patient and influences his condition accordingly." Osler⁷ is reported to have said, "The cure of tuberculosis depends more on what the patient has in his head than on what he has in his chest." In 1928 a survey⁵ was made of the opinions on this subject among some of the best known specialists on tuberculosis. Thirteen of twenty answered. Of these only one felt that the patient's attitude neither aided nor interfered with the treatment; the others agreed that the patient's attitude was a major factor in the treatment of and the prognosis in tuberculosis. Strecker, Braceland, and Gordon⁸ studied seventy-five patients, and they felt that in two-thirds of the cases "peace of mind" was the most important factor in recovery from the disease.

Because of the almost universal acceptance of the point that emotional factors are important in tuberculosis, there is no value in spending further time discussing this. It seems more important to see how the patient's personality and emotions affect the disease.

In the literature there are many statements such as the following: "In many of the patients with tuberculosis there is an undercurrent of bitterness and frustration."⁸ Another group of authors³ state their patients showed "anger, irritability, mild to pronounced reactions of either

masochism and sadism . . . depression, . . . explosive effects." Jelliffe and Evans¹ present an analysis of a group of tuberculosis patients and state they are childish, selfish, self-centered, irritable, easily angered, capricious with food, dissatisfied, and ungrateful. Other authors stress the positive relationship between guilt¹ and tuberculosis, genius⁴ and tuberculosis, sex² and tuberculosis, and the like. It appears that the literature contains a number of generalities concerning the peculiarities of patients with tuberculosis, and these generalities in being quoted become accepted almost as facts. In other words, a clinical observation such as "some patients appear to be unaware of the gravity of their illness" has been elaborated into "the fact" that patients with tuberculosis are in general euphoric.

Concomitants

It is unwise to place any segment of the population in a specific psychiatric category, for my observations indicate that the personalities of patients with tuberculosis vary as much as do any other segment of the population. Furthermore, I believe that what is observed in the behavior of tuberculosis patients depends on how their personalities handle the "concomitants" of the diagnosis of tuberculosis, namely: (1) the "meaning" of the disease to each patient; (2) the effect of being in the sanatorium itself; (3) the social implications of a chronic disease such as tuberculosis.

First of all, when the diagnosis is made, the patient is immediately categorized with a severe illness which connotes among other things that he is dangerous, infectious to others, and that he must be separated from people in general, and from his family in particular. In other words, the effects are stigmatizing and punitive. It is not hard to imagine what might happen to a patient who already is concerned with guilt feelings.

Second, the diagnosis of tuberculosis usually leads to hospitalization, and it is quite obvious that this concomitant will affect the patient tremendously. The patient is now in a milieu of

Read at the Fortieth Annual Meeting of the Mississippi Valley Conference on Tuberculosis and Mississippi Valley Trudeau Society, Minneapolis, October 16, 1953.

fellow sufferers. He is in an environment where time is measured in months and years rather than days. He is looked after completely. He has some new worries, it is true, but he has also left many behind. He is fed, bathed, and in general is cared for like a baby. The life here precludes normal experiences which make for maturity in a competitive world. It is clear that any patient's feelings regarding dependency will be involved.

Third, a diagnosis of tuberculosis results in many social implications. Among others, the sick patient is no longer able to take care of himself financially, socially, or sexually. His hopes and aspirations are dashed completely or at least must be postponed. Putting it another way, the patient can no longer expend his mental energy away from himself; and, therefore, it is of necessity directed toward himself.

Normal Reaction

Up to this point, the concomitants of tuberculosis have been discussed, and now it would be well to turn to what happens to the patient who is diagnosed as having tuberculosis. No one accepts the diagnosis with equanimity. Since the disease is a threat to one's security, the usual reaction that is seen is that of depression. There are, of course, good reasons for this reaction. The patient's plans and ambitions must of necessity be altered, his financial status is threatened, his future in general, including such fields as marriage, work, and school, becomes questionable. Yet it is well known that depression is not always observed; what is seen instead are the patient's defenses against these depressive feelings. These defenses may run the full gamut of human experience, from the active defiance and denial of one who cannot tolerate illness to the opposite attitude of contentment found in those personalities who find emotional satisfaction in the passive role of suffering.

At times the patient reacts with defiance or ultracheerfulness. This defiance is seen in patients who are usually seen the first time with serious lung lesions. These are the patients who are overactive, tense, and restless when in bed. The overactivity is probably related to the patient's inability to accept dependency. The ultracheerfulness that is sometimes seen is most likely a psychological defense against an intense fear of death. Others become resentful. They may be

formulated in this manner: "If I can't get what I want, I will get mad." Some become apathetic, or "I'm bad: I deserve it." And lastly, there are those who constitute an especially great problem in treating tuberculosis. This group of patients seem to relish the diagnosis with its long period of hospitalization and attached period of inactivity. To them the illness is a solution to their problems. An "acceptable" illness is what they have been waiting for, since up to now their lack of productivity and complaining has not been accepted by their doctors, family, friends, and associates. They have always felt, "I'm really a capable person, well fitted to make my way in life, dependent on no one; but I'm sick and must be excused." However, until being diagnosed as having tuberculosis, their complaints were not accepted. These patients are the ones that are so difficult to rehabilitate as recovery occurs, for a recovery means the patient must abandon his emotionally regressed attitudes and return to useful channels of effort and thinking.

Thus, it is quite clear that no single personality type is observed in patients who become infected with tuberculosis, but all personality types are found. The behavior evidenced by tuberculosis patients is due to the interaction between the personality and what has been referred to in this paper as the "concomitants of tuberculosis."

Pathologic Reaction

In the foregoing, the discussion has been limited to pointing out how the relatively stable personality types react to tuberculosis. How the so called pathologic reaction types respond to a diagnosis of tuberculosis will now be considered.*

The psychoneurotic group which makes up the great percentage of mental illness will be mentioned first. These patients in general are and should be treated by the patient's own physician, and this holds true in the sanatorium. In this group is found the patients who among other things preoccupy themselves with their ability to hold their spouses, with their doubts about sexual potency, and with their feelings of inferiority; and they are the ones who make excessive demands on their family and doctors. Only the more severe patients of this group are seen by

*Some examples of all these types have been seen during the past two years at Glen Lake Sanatorium, where the author has been the psychiatric consultant.

the psychiatrist, and some of these incorporate their unique ideas of tuberculosis into their symptomatology. The anxiety hysterics, for example, may become so "scared" that after recovery they will not touch anything and might even wear a mask at all times.** The obsessive-compulsives in the sanatorium are difficult persons to handle because of their trait of stubbornness and their inability to tolerate normally the behavior of others. They are the ones who may complain a great deal that their roommates in the sanatorium are untidy, dull, and the like. The hysterics in the sanatorium are the immature, "theatrical" type, who usually develop severe somatic symptoms toward which they are relatively indifferent. The true hypochondriacs present an unusual problem in that at admission and during active treatment they are in general quite pleasant, co-operative, and not too complaining. This behavior changes abruptly when their doctors hint that discharge is being considered. At this point they start to get innumerable somatic symptoms and they may begin to indulge in behavior which will be dangerous to their chest pathology.

Alcoholics, as is well known, constitute a major problem in the sanatoriums. These individuals cannot stand the ordinary tribulations of life; so, of course, when they are confronted with the frustrations of sanatorium life, they turn to alcohol more often than they did before.

The psychopaths, like the alcoholics, cause considerable trouble in all the sanatoriums. These are the people who act out their hostility and who, because of their psychopathology, are unable to form any type of doctor-patient relationship at the sanatorium. They are the patients who are always getting into scrapes and blaming others for their getting into them. They are the ones who have the most unexcused absences. And finally, they are the ones who always appear superficially to want help with their emotional problems, but, when it is available, never utilize it.

The schizophrenic reaction types usually manifest themselves with their apathetic, silly, and unexpected emotional responses, with their thinking disorders, and their hallucinations and delusions. Most of the time they are unconcerned about their tuberculosis. The severe schizophrenics must of necessity be committed to a mental hospital. The

mild schizophrenics, however, are always about in a large sanatorium population and can be managed there. They may manifest themselves by just being mildly suspicious, queer, or odd.

The manic-depressives may evidence themselves by their disregard for their illness. Their overactivity is a severe complication to the successful management of their tuberculosis and probably is an important contributing factor to their hospitalization for tuberculosis. The severe depressives on the other hand evidence no will to get better, and this, if allowed to go on without psychiatric treatment, will ultimately lead to a poor convalescence.

The seniles' physiological mechanisms as well as their personalities are quite rigid, and thus they are unable to conform to the usual restrictions of the sanatorium. They require different surroundings from the rest of the patients in the sanatorium. If they are not segregated, either they or their roommates will leave against medical advice. It is best to cater to their whims and be somewhat lenient regarding regimentation.

Homosexual personalities find tuberculosis a particularly difficult problem to handle in the sanatorium, for they must of necessity be exposed intimately to those of their own sex. The psychiatric symptoms that may present include simple anxiety, panic, or "Don Juan" or nymphomaniac behavior.

Treatment

How the "normal" and "abnormal" personality types react to tuberculosis have been discussed. The behavior that presents itself is due to the anxiety produced by the interaction of the individual personality with the concomitants of the diagnosis of tuberculosis. Treatment here, as in all psychiatric treatment, is aimed at reducing anxiety. There is, however, a specific problem which is peculiar to patients with tuberculosis. In usual psychiatric treatment the psychiatrist at times attempts to raise the level of anxiety in order to reach the ultimate goal of reduction more efficaciously. This is not done in tuberculosis, for it is a fairly well accepted fact that an increase in anxiety is detrimental to pulmonary tuberculosis.

Although the fact has been stressed that to treat tuberculosis effectively, the anxiety must be

**A patient of this type is now in Glen Lake Sanatorium.

reduced, this does not mean that this should be done without first getting a relatively clear picture of the personality of the patient. If a personality evaluation is not obtained, what behavior is to be expected from the patient will not be known. For example, it is important to know that in certain personality types it is almost impossible to get any reduction in the basic anxiety level, and, therefore, definitive psychiatric treatment is of limited value. In this category can be mentioned the psychopath and the confirmed hypochondriac. One of the major problems a psychiatrist has at a sanatorium is to emphasize to the house staff that with certain personality types there is little that can be done from the psychiatric point of view at this time. This is not unlike the house staff stating that some lung lesions are still untreatable in spite of all the new therapeutic tools available.

A few principles which are useful to both psychiatric and non-psychiatric personnel in lowering the anxiety level should be emphasized. These principles will be effective in some degree in treating both the so called "normal" and "abnormal" personality types.

1. A good patient-doctor, patient-nurse relationship should be set up. This can be done by letting the patient talk, and then listening with an attitude of serious professional interest—not one of indifference or over concern. The assurance of genuine interest and sympathy captures patients' confidence and secures co-operation. The patient should be led to know recovery is expected, or if that is impossible, that full use of his remaining capacities is to be achieved.

2. The patient should be told the truth about his status. Information should be made available to the patient in language he understands. Patients resent being kept in the dark, and this may lead to their attempting to get information elsewhere which may be inaccurate. Patients who understand the nature of their illness and the reasons why procedures are being carried out are less likely to act against their best interests.

3. The sanatorium should be kept as homelike

as possible with a minimum of restrictions. It is well to be liberal and consistent about passes, visitors, and leaves.

4. Male and female patients should not be completely segregated socially.

Summary

Tuberculosis is a disease involving all classes of society, and the same neurotic trends and abnormal personality traits found in any cross section of society will be found in tuberculosis patients. The particular behavior evidenced is due to the interaction of the personality with the concomitants of the diagnosis of tuberculosis, namely:

1. The "meaning" of the disease to each patient.
2. The effect of being in the sanatorium itself.
3. The social implications of a chronic disease.

To treat patients with tuberculosis adequately, a study of the personality with its attached anxieties is a "must". The treatment of the personality is usually what makes the management of tuberculosis difficult; the actual treatment of the organic disease generally is relatively simple.

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1641 Medical Arts Building

The undetected case of tuberculosis in a mental hospital is a menace to everyone in the community. The patients in the hospital, the employees, the visitors, and the families to whom the patients return are all subject to infection from the unknown case.—ELIZABETH S. KLEITZSCH, *NTA Bulletin*, February, 1954.

Laboratory Aids to Medical Practice

Sponsored by
The Minnesota Society of Clinical Pathologists

Rh-Hr BLOOD TYPES AND HEMOLYTIC TRANSFUSION REACTIONS

G. ALBIN MATSON, Ph.D.

Minneapolis War Memorial Blood Bank

HEMOLYTIC transfusion reactions have been caused by incompatible blood factors of various blood-group systems.

The A-B-O System

Although the A-B-O system was the first to be discovered, it still is important in hemolytic transfusion reactions. This is not for lack of technical skill or laboratory know-how. With the highly avid and potent antisera now available as testing reagents, technical errors by the careful laboratory worker have been reduced almost to nil. Failure to read labels, inadvertent interchange of blood-grouping serums, inadvertent interchange of bottles of blood for two patients, patients with similar or identical names receiving blood meant for the other person and placing the wrong pilot tube on a bottle of blood are some of the causes of transfusion reactions in this system that harass the transfusionist and laboratory worker. Each hospital should set up a procedure that will reduce to a minimum the possibility of such errors.

The Rh-Hr System

This system offers the most frequent cause of hemolytic reactions in sensitized patients. In this system the causes of hemolytic reactions are often due to technical errors. Typing serums often leave something to be desired in avidity and potency; even with the best of antisera, the nature of the clumping is much less firm and more transient than is the case in the A-B-O system.

The introduction into Rh techniques of bovine albumin, by increasing the percentage of protein and making possible the demonstration of block-

ing (albumin agglutinating) antibodies, is nevertheless not without its problems, one of which is the tendency toward nonspecific clumping. Hemolysis in pilot tubes is an unsolved problem; in no serologic work is the absolute necessity of chemically clean glassware more important than in Rh typing and crossmatching.

Most commonly the hemolytic reaction occurs in an Rh negative, Hr₀(d) recipient who has been sensitized against the Rh₀(D) factor. Since the completely Rh negative patient, rr (cde/cde), also lacks the rh'(C) and rh"(E) factors, he may become sensitized against these factors in donors' blood, as well as against the Rh₀(D) factor.

Commonly the Rh negative patient transfused with Rh positive blood is exposed to more than one Rh isoantigen as when Rh₁(CD) or Rh₂(DE) or Rh₃(CDE) blood is given. He may, therefore, form antibodies against several factors simultaneously. However, of the Rh factors, Rh₀(D) appears to be the most antigenic. Because of these differences in antigenicity, the sensitized Rh negative recipient of Rh positive blood rarely develops sensitization to rh'(C) only, or to rh"(E) only, although the presence of antibodies against either of these in combination with antibodies against Rh₀(D) is a common occurrence.

Occasionally, a patient who is positive to Rh₀(D) but negative to rh'(C) or rh"(E) can, through multiple transfusions, develop sensitization to rh'(C) or rh"(E); or a person positive to any or all of the three specificities of Rh can become sensitized to the hr'(c) or hr"(e) factors and presumably, on extremely rare occasions, to the Hr₀(d); or the Rh positive or Rh negative patient may become sensitized by transfusions of blood involving blood factors other than those in the Rh-Hr system, such as A, B, M, S, Kell, Lewis, Duffy, Lutheran, Kidd and the more re-

This is the sixteenth in a series of reports sponsored by the Minnesota Society of Clinical Pathologists and designed to foster closer relationships between the practicing physician and the pathologist.

cently discovered U factor. No transfusion reactions have been reported from the P factor.

Crossmatching

Sometimes when a patient has received multiple transfusions and has become sensitized against more than one factor, the problem of selecting compatible blood for the transfusion may prove to be vexing. In these cases, it should be possible to demonstrate in the recipient's serum an antibody that clumps the donor's cells but not the recipient's own cells. In order to establish the nature of the isoantibody in such a patient's serum, as complete a typing procedure as possible should be carried out. In order to make a decision in such difficult transfusion problems, the hospital laboratory often finds it necessary to refer the blood to a central blood-grouping laboratory where rare typing serums are available and where a panel of blood specimens is at hand, some specimens containing and others lacking the blood factors in question. Nearly always, however, antigenic incompatibilities can be detected by careful crossmatching tests before blood is given to a patient.

Crossmatching has a dual purpose: (1) to detect intragroup incompatibilities and (2) to check further the accuracy of the A-B-O and Rh typings. Three methods of crossmatching should be judiciously employed in the laboratory of any hospital in which transfusions are done. For the techniques of these tests a good laboratory manual should be consulted. It is my opinion that the best outline of techniques for these tests as well as other blood-bank procedures is the recently published manual entitled "Technical Methods and Procedures of the American Association of Blood Banks," published by the Burgess Publishing Company, Minneapolis.

The three methods of crossmatching are:

1. *The Conventional Saline Test-Tube Crossmatch.*—This is the best check for incompatibilities in the A-B-O system. Moreover, isohemolysis is more easily observed by the saline agglutinating technique.

2. *The High-protein Crossmatch.*—This is the method of choice for detecting the presence of immune antibodies of the albumin agglutinating or blocking variety.

3. *The Antiglobulin Technique, or Indirect Coombs Crossmatch.*—This is the most sensitive method used in crossmatching for detecting iso-sensitization. It also detects rare antibodies, such as anti-Fy (anti-Duffy) and anti-Jk (anti-Kidd), which are not demonstrable by the high-protein or saline techniques. The antiglobulin method is too delicate and time-consuming, however, for routine work and should be performed, therefore, in (1) persons who have received transfusions in the past or who are receiving multiple transfusions over a protracted period (longer than a week); (2) in women who have been or are pregnant and (3) in patients in whom any type of unexplained reaction has been reported in the past.

It should be pointed out that dire emergencies may not provide sufficient time to do all the grouping, Rh and crossmatching tests. In such emergencies, group O, Rh negative "universal donor" or even group O, Rh positive blood may be used in order to save the life of the patient. A note should be entered on the patient's chart to justify the procedure.

Many blood banks do anti-A and anti-B titrations on group O, Rh negative blood donors and segregate for use as universal donors those who have low titers (less than 1:200). This practice permits ready availability of universal-donor blood for emergencies and exchange transfusions in infants.

Few of us realize that tuberculosis is both a cause and an effect of indigency. It is simple to grasp the fact that poverty lowers resistance so that the disease spreads rapidly when families live on an inadequate or unbalanced diet, are crowded into unsanitary homes, can obtain little education. But we do not always stop to think how directly tuberculosis leads to poverty in families where

it did not previously exist. A recent study of a sizable group of patients pointed out that less than 2 per cent of the patients' families were relief recipients at the time of diagnosis; upon being admitted to hospitals a few months later, 16 per cent of the families of these same patients were on relief.—MARY DEMPSEY, Statistical Unit, NTA, Feb. 3, 1954.

President's Letter

MEET, MEET, MEET—

Sometimes it seems endless. Sometimes we feel that we shall never get through attending meetings. Sometimes we wonder if it is worth it, the time we spend at medical meetings.

But, I would like to point out that it is worth while, that we do gain, grow and improve as a result of spending time with our colleagues at meetings of our own groups, and of others too.

Within the past few years, especially, medical meetings have become much more plentiful. More special groups have been organizing, and established organizations have increased the number of meetings during each year. Local groups have increased in size and importance, and have expanded, making it almost obligatory to hold more meetings.

Thus it becomes a matter of selection for the physician. He must choose between attendance at several interesting and valuable sessions. He must also decide how much time away from the office and home he can spare. No wonder he occasionally finds himself in a dilemma of indecision.

A primary example of this situation is seen in the events of this and the past month. The beginning of June marked the 101st annual session of our own state association, featuring many meetings of committees, the Council, the House of Delegates, special groups—not to mention the authentic and interesting discussions in the scientific sessions. Also, many county societies held meetings prior to the Duluth convention.

And, immediately on the heels of the state meeting, the great annual session of the American Medical Association began in San Francisco. Many Association members found it necessary to leave our state meeting directly, and hurry west for the national meeting.

But, such is the life of the busy physician of today. He makes arrangements for the care of his patients if he finds it necessary to be away from his office. His colleagues are ready and willing to fill his shoes temporarily so that he can attend these excellent events, and thus benefit from what are actually post-graduate courses for all physicians. And, most likely, the following year he will arrange with a colleague to reverse positions so that each may enjoy the rich advantages of meeting attendance.

Because of the vast scope of medical knowledge available today, it can be seen that a large number of scientific meetings is one important method of disseminating information to the physicians of the country. And, because it is impossible for each doctor to be present at all such meetings available to him, it is to his lasting advantage to attend whenever possible.

I am sure that your attendance at the state meeting in Duluth proved to be not merely "meety," but meaty—a pun more true than clever. What you gained from it will become a part of your daily practice, and will be of lasting value.



President, Minnesota State Medical Association

Editorial

ARTHUR H. WELLS, M.D., *Editor*; HENRY G. MOEHRING, M.D., and JOHN F. BRIGGS, M.D.

PUBLIC EDUCATION—YOUR DUTY

THE MEDICAL needs of the people of America are increasingly yearly in many ways. Those that are obvious because of the extension of life expectancy need not be cited to any physician, such as geriatric care, refined surgical techniques, "wonder" drugs, and psychogenic problems associated with the fleeing tempo of living. However, with this change of living, an increase in means of communication has brought about another problem. One cannot listen to the radio, view television, read a newspaper, or peruse a periodical without being overwhelmed by articles or advertisements extolling the wonders of a laxative, a cigarette, a cold remedy, or a panacea. This lack of information—or worse, these untruths, have presented a new challenge to true and adequate medical care. Patients now often tell the physician what treatment they should receive as pointed out in a lay periodical, or swamp him with requests for a yet unproven remedy or cure which has been quoted by an energetic author. Medicine and health are news!

With these changing times the medical profession must adjust its mode of approach and re-evaluate its position. In making such an adjustment, the "Principles of Medical Ethics" of the American Medical Association states in Section 5:

"Educational Information is Not Advertising.—Many people, literate and well-educated, do not possess a special knowledge of medicine. Medical books and journals are not easily accessible or readily understandable.

"The medical profession considers it ethical for a physician to meet the request of a component or constituent medical society to write, act or speak for general readers or audiences. The adaptability of medical material for presentation to the public may be perceived first by publishers, motion picture producers or radio officials. These may offer to the physician opportunity to release to the public some article, exhibit or drawing. Refusal to release the material may be considered a refusal to perform a public service, yet compliance may bring the charge of self seeking or solicitation. In such circumstances the physician should be guided by the decision of official agencies established through component and constituent medical organizations."

In effect, then, it becomes the duty of every physician for several reasons to contribute his efforts as needed to the health education of the population. This serves: (1) to better the public relations of medicine (and this is always needed); (2) to educate the public (an educated public is reasonable and understanding); (3) to refute dangerous and unethical claims in protecting the public; and (4) to contribute his public service in a way that the population recognizes. The one and only question of past years was that of this being promotional or advertising. The code states that it is not, and established statistics prove that it is not.

Thus, the medical problem of education of the public takes its place in the practice of medicine, informally in the office, and formally in speaking or writing. To quote Dr. W. Bauer, head of Health Education of the American Medical Association, "Not only is the appearance of the doctor in public for public service accepted by the profession, but it is his duty to do so."

JAMES R. FOX, M.D.

IN DEFENSE OF ROBIN HOOD

TWENTY-FIVE years ago, Orphan Annie was being condemned by those with Communistic affiliations because she and Daddy Warbucks were counted as capitalistic propaganda. Several months ago an advisor to the Indianapolis Board of Education recommended that the Robin Hood stories should be banned because he took from the rich and gave to the poor, therefore he is Communistic. Note that the ban was advised, not because Robin Hood violated the common law by forcibly taking someone's property, not because he broke one of the Ten Commandments by stealing, but because he was soft-hearted enough to give what he had taken to the people who were in need. In passing, we wonder in what sort of position such reasoning leaves those active in Community Fund and similar drives.

However, lest we leave Robin Hood with his escutcheon besmirched—we can safely leave our

Community Fund folks to the judgment of their fellows—remember that 600 to 700 years ago the oppressors of the poor were the rich prelates and barons. To be popular, ballads, which were heard mostly by the poor, had to have a hero who turned the tables on these oppressors. Somehow that doesn't lead us to classify the hero as a Communist by whatever definition of Communism. R. Valentine Harris, author of *The Truth about Robin Hood*, points out that it is proven that a Robin Hood followed the Earl of Lancaster in battle in 1322, and that a Robin Hood was in the King's service in 1323-4. Further, that the Robin Hood of the ballads was a God-fearing Englishman who honored his king, regarded the deer as "fair game," and considered those who oppressed the people as his enemies. Rather than ban such a Robin Hood from our society, perhaps we should hope that his brand of leadership will prosper in the world.

H.G.M.

THE CHEMOTHERAPY OF TUBERCULOSIS

TEN YEARS have passed since the first report on streptomycin. During this decade, there have been many intensive investigations of this drug in the treatment of tuberculosis. During the same period, many other antituberculous drugs have been studied in both laboratory experiments and clinical investigations. As a result, it is now agreed generally by experts in tuberculosis that chemotherapy is indispensable in the treatment of all forms of this disease.

Although much about the chemotherapy of tuberculosis remains unknown, certain basic generalizations can be made and clinical practice should be guided by these. First of all, none of the drugs available today are bactericidal. Secondly, the therapeutic efficacy of each drug is impaired by the occurrence of drug-resistant variants of tubercle bacilli; these resistant microorganisms may become predominant so that further treatment with the particular drug concerned may be of no value. In the third place, the emergence of drug-resistant strains of tubercle bacilli may be delayed or prevented by the administration of two antituberculous drugs concurrently.

Therefore, the chemotherapy of tuberculosis should consist of the concomitant administration

of at least two antimicrobial agents long enough for the defense mechanisms of the host to exert their maximal effects. The available data indicate that the combination of any two of three drugs, namely streptomycin, para-aminosalicylic acid and isoniazid, is satisfactory. The optimal duration of therapy is not known; undoubtedly it varies tremendously depending on the extent and character of the disease as well as certain immeasurable host factors. However, it is agreed generally that antituberculous chemotherapy should be continued for a minimum of eight to twelve months, and in many instances the treatment should be kept up for several years.

In a consideration of the effect of drugs in tuberculosis, it is of value to divide the disease into reversible and irreversible parts. Medical treatment and collapse therapy is recommended for the reversible component and surgical excision for the irreversible residue whenever the latter is of clinical significance. The greatest problem at the moment is to determine which residues are of sufficient importance to warrant resection.

It should be emphasized that in spite of the development of effective chemotherapy other forms of treatment are needed to control the disease in most patients. Rest in bed and collapse therapy are still invaluable, as is adequate nutrition. For these, as well as for the education of the patient and the protection of society from a contagious disease, the sanatorium or the hospital remains the best place for the treatment of most tuberculous patients. However, it is becoming increasingly evident that it is not only impossible but also unnecessary to keep patients in a sanatorium throughout the long period required for chemotherapy.

Therefore, it is necessary for general practitioners and internists to acquaint themselves with the latest developments in the treatment of tuberculosis, especially the use of antimicrobial drugs, so that they can continue to do their share in the control of this disease.

DAVID T. CARR, M.D.

VIRAL HEPATITIS

REPORTS of cases of infectious hepatitis have been increasing in Minnesota for the past ten years. The nation, as a whole, has experienced a similar increase. During the year 1953, there were 1192 cases with thirteen deaths reported to

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the Minnesota Department of Health. Cases have been reported from all sections of the state with a concentration of cases in Little Falls and vicinity. Infectious hepatitis is also known as infectious or catarrhal jaundice, and is caused by a filterable virus. The disease is most common among children and young adults, and is seen most frequently in autumn and winter.

Infectious hepatitis is an acute infection with variable symptoms including fever, loss of appetite, nausea with or without vomiting, headache, lassitude, fatigue, and abdominal discomfort with a feeling of fullness in the upper abdomen. In many cases after the fever has subsided, the urine may become dark due to the presence of bile, and the patient may become jaundiced. Occasionally, there may be a chronic impairment of liver function. Usually the white blood count is low and liver function tests show impairment of the liver function. Most cases have a benign course with many so mild that they are not recognized. Rarely acute fulminating cases occur terminating in acute yellow atrophy of the liver.

Clinically infectious hepatitis is indistinguishable from serum hepatitis (homologous serum jaundice). The chief points of difference are the incubation period and the mode of spread. The incubation period in infectious hepatitis is from fifteen to thirty-five days, the average being twenty-five days. In serum hepatitis the incubation period may be as long as six months; probably twelve to fourteen weeks is most common. In serum hepatitis, the mode of spread is by inoculation of infected blood or blood products and by use of needles and syringes contaminated with traces of blood from infected persons. Both infectious hepatitis and serum hepatitis are caused by viruses that are closely related. The causative agent of infectious hepatitis is designated Virus A and of serum hepatitis Virus B. Both viruses are relatively resistant to heat but are destroyed by autoclaving or by boiling for fifteen minutes. Virus A (infectious hepatitis) is present in the blood for a short while during the acute stage of the disease and in the stools for a longer period of time. The virus has not been demonstrated in nasopharyngeal secretions or the urine. Virus B (serum hepatitis) is present in the blood of infected persons and has been known to persist for as long as five years.

Virus A (infectious hepatitis) is spread by the fecal-oral route. Respiratory spread and spread

by contaminated blood is apparently negligible for infectious hepatitis. Food and waterborne epidemics have been reported. Fingers, food, and flies are important in the spread of infectious hepatitis.

Control measures are dependent on good personal and community hygiene. Cases should be reported to the local health officer and the State Department of Health as required by regulation 301. The case should be isolated for the first week of illness. Bowel discharges should be properly disposed of. Outdoor toilets should be kept clean and fly proof. Hands should be washed carefully with soap and water after use of the toilet, before handling food and before eating. While respiratory spread probably is not important, it is advisable to dispose of nose and throat discharges in a sanitary manner. Early medical care is essential to guard against complications. Children should be excluded from school until clinically well. Quarantine of contacts is not indicated.

Immune serum globulin (gamma globulin) has proven effective at least as a temporary preventative for infectious hepatitis (Virus A) and will stop the occurrence of cases where there is close continued contact if the exposed individuals are injected before the last week of the incubation period. The Minnesota Department of Health distributes gamma globulin for this purpose to the family physician. The recommended dose is .02 cc. per pound of body weight with a maximum dose of 2.0 cc. per individual. There is no age limit for the protection. While the disease is uncommon after the age of forty, the severity of infectious hepatitis is more marked in the older age group.

Infectious hepatitis cases in Minnesota have increased since the five-year period 1934-1938 with seventy-two cases and six deaths to a total of 2,071 cases during the years 1949-1953 with forty-five deaths.

Preventive measures should do much to lessen the occurrence of this disease.

To prevent any possible spread by stylets, needles or syringes, they should be thoroughly sterilized by heat sterilization. It should be realized that in giving subcutaneous intramuscular or intravenous injections the syringe may be contaminated by traces of blood drawn into it.

D. S. FLEMING, M.D.

The Dean's Page

A REPORT ON MEDICAL EDUCATION IN KOREA

During the latter part of the past winter, three members of the University faculty visited Korea at the request of the Foreign Operations Administration to determine what might be done to assist the National University of Seoul to rehabilitate and strengthen its programs in agriculture, engineering, and medicine. Dr. Gaylord Anderson represented the Medical School in this study and was accompanied by Deans Harold Macy and A. F. Spilhaus in agriculture and engineering, respectively. Dr. Anderson's report has been of real interest to all of us.

The Medical School at the Seoul National University is almost identical in size with that at Minnesota and provides instruction of physicians and nurses. Established about fifty years ago, it remained under Japanese domination until 1945. In accordance with this policy—which is far from unique in the history of colonialism—the Japanese occupied all the key positions. As they viewed the school's purpose to be the training of Koreans to give medical care to Koreans, no attempt was made to develop a faculty of Koreans who had had special post-graduate training for their teaching responsibilities.

As a consequence of this policy, the liberation in 1945 and expulsion of the Japanese found the School forced to pull together a faculty, most of whom had had no formal instruction beyond that which they had received in their own school as undergraduates. Few had ever studied outside of Korea.

With the advent of war barely five years later, the School was forced to take refuge in Pusan where it operated in makeshift quarters until the fall of 1953. With the war came the capture of several of the key members of the faculty, who were unable to escape to Pusan and are now thought to be dead. Others went into the ROK army and are still on duty.

For four years the remains of the staff operated a medical school as best they could. All equipment had been lost. Laboratories were not available and hospital equipment was limited to what could be loaned from the United States Army sources.

No library was at hand; Japanese texts were banned; Korean texts non-existent and English texts, even if available, were understood by few of the students. Thus reliance was placed almost exclusively upon didactic lectures which have always assumed a more important role in the Oriental medical curriculum than they have in ours.

The return to Seoul in the fall of 1953 meant only a new stage of improvisation, for the United States military forces did not vacate the Medical School and University Hospital compound until March 1, 1954. The return of the buildings meant nothing more than the term implies for those are mere buildings and nothing more. Four years of military occupation, during which the city changed hands four times and was occupied for extensive periods by the Communists invaders, have taken their toll upon the School and Hospital buildings. Though ample in size and firm in construction, they stand completely bare of anything resembling equipment for either teaching or the care of patients. All equipment has been lost, laboratory benches and plumbing ripped out, and physical damage done to the buildings.

THE DEAN'S PAGE

Such is the situation faced today by this Medical School. Both school and hospital must be completely re-equipped. The latter has started to operate on a reduced scale with surplus equipment provided by the United States Army, but this provides only the bare essentials. The school must start from the bottom for it lost essentially everything. The faculty is intensely sincere and devoted to its task, but fully realizes the limitations of its background and that for four years of war it has been out of touch with medical developments except for its contacts with foreign military units. Even today they are devoid of books and medical journals. Furthermore, they have inherited a system of medical education that emphasizes the formal lecture and makes little provision for clinical study as we know it in the United States. The curriculum of the junior year provides for only an hour a day of clinical work and in the senior year an hour and a half. Hospital facilities for more time are not easily obtainable.

The rehabilitation of this school obviously requires equipment and staff education. The former is under order and will arrive slowly. The latter will take time. It means study outside of Korea for the senior staff so that they may not only gain further technical knowledge but also learn methods of clinical instruction. For the younger staff, who will be the teachers of fifteen to twenty years hence, it means several years of postgraduate fellowship; and for those who cannot leave Korea, it means an intensive local instruction in modern medical developments. Such are the needs of this school.

HAROLD S. DIEHL, M.D.
Dean of the Medical Sciences
University of Minnesota

OVEREATING—THE ROOT CAUSE OF WARS

In the Golden Age, i.e., at a period when all was righteousness and when there was no competition for food, everyone ate just what one wanted and everyone was happy. But as time passed, some people ate a little too much, simply because it was available. The result was that their bodies became heavier. On account of the body becoming heavier, they became tired after performing their usual work. On account of weariness, they became lazy. On account of laziness, they developed a desire to accumulate food and articles for future use, i.e., hoarding. On account of the desire to accumulate, there arose possessiveness. On account of possessiveness, there arose greed.

In the second stage, on account of greed, the desire arose to accumulate more by deceiving others. On account of this desire to deceive others, there arose falsehood, and falsehood gave rise to many passions, such as lust, anger, vanity, hatred, haughtiness, injury, fear, excitement, greed and mental perturbation, et cetera.

The leaders who are thus perturbed in mind lead their followers into unrighteous conduct. On account of greed, anger and delusion, they insult weaker people and have recourse to violence with deadly weapons, ending in wars between countries, clans and races. They thus either destroy others or are destroyed by others in the struggle. In this manner, unrighteous conduct which starts with greed in slight overeating, leads to wars between nations.

(Theory of the cause of wars by Charaka, a medical authority of India, who is supposed to have flourished in the first century A.D.)

Medical Economics

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

PENTAGON CITES M.D. SECURITY RISKS

With all the recent hullabaloo about security risks, and the famous committee hearings conducted in Washington, it is interesting to note that the Secretary of Defense has stated that fifty-one physicians or dentists have been refused commissions in the Army for security or other reasons.

As small as this figure may seem, it could be classed as "alarming" by those concerned with the feelings and policies of the medical profession.

According to an article in a recent issue of "U.S. News and World Report," which reports on the hearing on S.3114 before the Senate Armed Services Committee, Secretary of Defense, Charles E. Wilson, revealed these things: "Fifty-one physicians or dentists, called in the draft, have failed to answer loyalty questions satisfactorily or are otherwise unfit for commissions. The armed forces still want to use them, but as the lowest-paid privates, if the law is changed. Other security risks are known and being watched."

To Rout Out Risks

Secretary Wilson stated that "The Department of Defense is undertaking, through administrative action, to tighten up the procedures that deal with Communists and security risks to carry out the intent of Congress." He testified:

"It was found that the loyalty certificates, although required of officers and enlistees before acceptance, were delayed for inductees until after induction. This is being changed to require certificates to be filled out before induction by all personnel the same as is required in enlistments and in appointment to commissions."

Secretary Wilson explained further in his testimony that only twenty of the fifty-one doctors are considered to be serious security

risks, and that the remainder "have something about them that they do not qualify as officers." He pointed out that the doctors were all inductees, and had requested a commission. The Armed Services committee was conducting the hearing in order that certain changes in these regulations could be drawn up.

Pending these requested changes, Secretary Wilson had issued the following directive: "The Department of Defense has recommended to the Congress an amendment, S.3096, to the Doctor Draft Act. Pending action by the Congress, and until further notice, no physician or dentist who has been called under the Doctor Draft Act and who has been denied a commission shall be inducted into the service as an enlisted person unless he can qualify for a commission pursuant to the standards for security and loyalty prescribed by the military department concerned."

STRANGE BEDFELLOWS ON REINSURANCE PLAN

The line-up of pros and cons on the Administration's proposed plan for reinsuring present health insurance plans, shows a strange assortment of perennial opposites of national groups

Those favoring the plan include the national Blue Cross Commission, the American Hospital Association, and Dr. George Baehr who is president of Health Insurance Plan of New York City, and the Physicians Forum, Inc. A representative of the Farm Bureau Insurance companies said "We wish it were available."

Those against the plan, or favoring revision and improvements, include the American Medical Association, national Blue Shield, the United States Chamber of Commerce, the American Dental Association, the American Federation of Labor, the Association of Casualty and Surety Companies, the Bureau of Accident and Health

Underwriters, and the Health and Accident Underwriters Conference.

Hearings on the proposal brought out many thoughts, both pro and con, about the bill and its purposes. As reported in the AMA Washington Letter, John H. Miller, vice president and actuary of the Monarch Life Insurance Company, appeared in behalf of the last three groups named in the above paragraph, actually supported the general objectives of the program, but could not endorse the bill as it stands. He stated: "(1) The principles of reinsurance are the same as the principles of insurance; reinsurance cannot be applied to a risk that is not insurable; reinsurance does not help to sell insurance, nor does it reduce the cost of insurance. (2) Direct assistance to low-income groups on the local level is to be preferred to the disguised federal subsidies contemplated in the reinsurance plan. (3) It is important that the public not be misled into believing that reinsurance is a panacea, because reinsurance does not 'enhance the power of insurance' to reach those who are not now covered."

William S. McNary, vice president of the Michigan Hospital Service, was official spokesman for both the Blue Cross Commission and the American Hospital Association. His endorsement was limited to the purposes of the House bill on reinsurance. He recommended that the bill should be amended in three aspects:

1. Regulations promulgated by the Secretary should have the approval of the Health Service Council.
2. Confidential information for statistical purposes from a carrier should not be released without the approval of the individual carrier.
3. The language dealing with the publicity regarding the reinsurance plan should be rewritten and clarified.

He stated that 90 million Americans have some type of hospital prepayment coverage at the present time; that coverage of the balance is urgently needed; that the total goal to be attained under voluntary prepayment will not come easily.

Speaking for the U. S. Chamber of Commerce, Edwin J. Faulkner voiced opposition to the plan. Its enactment, he said, "would create in the minds of the general public a belief that it offers

an adequate solution to health problems. This would be a delusion and, therefore, wrong."

The CIO witnesses discounted the plan as a dubious and puny assault on a tremendous problem and they voiced continued faith in national health insurance.

Dr. George Baehr, president and medical director of the Health Insurance Plan of Greater New York, said the bill would help to promote a "balanced health program for the nation," but only if H.R. 7700 is enacted with it. This bill would guarantee mortgage loans of private institutions for the purchase of medical facilities and equipment by organizations supplying voluntary, prepayment, group practice medical care.

Long on Aspirations

The American Federation of Labor, testifying in the person of Nelson H. Cruikshank, stated that the bill does not meet the nation's needs. He added, however, that a direct subsidy to voluntary health insurance plans would be a better way to extend coverage to people now ineligible or unable to afford insurance. He concluded:

"We can find nothing in it that provides a positive incentive for the commercial insurance companies to meet these major social objectives. That is why we have come to the conclusion that this bill is long on its aspirations and goals but timorous and hesitating in its applications."

Blue Shield and Blue Cross Differ

The national Blue Cross Commission was represented by Richard M. Jones, its director, who said, "The eighty-three Blue Cross plans throughout the world feel unanimously that the program for reinsurance is a step in the right direction to facilitate exploratory measures in particular areas of the American population . . . it is the feeling of the plans that the reinsurance bill will afford the opportunity for even greater expansion of coverage."

On the other hand, Blue Shield Commission endorsed the basic objectives of the bill, but Frank E. Smith, its director, stated that the reinsurance proposal "may well be unnecessary with respect to Blue Shield plans," because these plans had "demonstrated their ability to stand on

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Minnesota Academy of Medicine

Meeting of April 8, 1953

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 8, 1953. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p.m. by the President, Dr. E. A. Regnier.

There were forty-three members and two guests present.

Minutes of the March meeting were not read.

The following men were elected as candidates for membership in the Academy:

Minneapolis—Dr. John J. Boehrer, Dr. Lyle Hay, Dr. C. A. McKinlay, Dr. Baxter A. Smith, Dr. R. S. Ylvisaker.

University of Minnesota—Dr. James R. Dawson and Dr. Frederick H. Van Bergen.

Amendments to the Articles of Incorporation and By-Laws were read, to be voted on at the May meeting.

The scientific program followed.

DR. ROBERT F. MCGANDY, of Minneapolis, read his Inaugural Thesis as follows. Lantern slides were shown.

LIPOSARCOMA OF THE EXTREMITIES

ROBERT F. MCGANDY, M.D.

Minneapolis, Minnesota

Although simple lipomas are quite common, malignant fatty tumors are thought of as rare. In 490 cases of fatty tissue tumors at Johns Hopkins Hospital, twelve were liposarcomas. In a similar series some years ago at New York Presbyterian Hospital 1,454 cases of lipoma were found to twenty-one liposarcoma. In 1943, Stout in his original paper on liposarcoma could only assemble forty-three cases. In the next eight years or up to 1951, he collected a total of 262 cases.

Ewing feels that liposarcomas occur much more frequently than is generally thought, and that reports in the literature do not reflect the true incidence of the disease. He furthermore states that the wide divergence in structure between fat tissue and benign lipoma and the various types of liposarcoma has stood in the way of recognition of these tumors. Stout agrees stating that liposarcomas are commonly misdiagnosed or not diagnosed at all.

The majority of these tumors develop late in life, although they can occur at any age. Sixty per cent are past the age of forty and the mean age is fifty-three. Although lipomas are more common in the female, liposarcomas seem to be distributed apparently equally between males and females.

The etiology of liposarcomas is unknown. There are those who feel they originate from pre-existing lipomas which may be benign, lying dormant for years and then suddenly become malignant and begin to grow. Stout agreed with this in 1943, but more recently feels he was in error when he re-studied an early case in his series. Most writers apparently feel that malignant liposarcomas have no connection with benign lipomas although they can appear together. Trauma, which seems to be mentioned in so many tumors and diseases, is suggested in liposarcomas but Ewing does not think it is a causative factor. Disturbances in thyroid and pituitary states, congenital situations and even alcohol have been suggested as etiological factors.

Liposarcomas can occur wherever we find fatty tissue.

Ewing felt they were most frequent in the intermuscular, perineal, periarticular and mediastinal regions. Others have thought of liposarcomas as being located principally in the retroperitoneal, and perirenal regions or in the mesentery and omentum. Stout feels this variation is due to selective reporting and the fact that many liposarcomas elsewhere are missed. In his present series of 262, the general distribution has remained approximately the same, but the number in the lower extremity has grown disproportionately with any other region. In order of frequency the distribution in these 262 cases is: lower extremity, 118; retroperitoneal, omental, mesenteric and perirenal areas thirty-six; trunk thirty-six; upper extremities twenty; head and neck seventeen; breast twelve; mediastinum and diaphragm five; kidney three; vagina and vulva two; spermatic cord and testes two; broad ligament two; lung two; one each in the orbit and maxillary sinus and region not stated five. He furthermore states that the liposarcomatous elements in some mesenchymomas or mesodermal tumors were not included in this list. Stout also calls attention to the fact that liposarcomas look very much like fibrosarcomas and can imitate fibrosarcomas. He calls attention to areas with huge foamy lipoblasts and the presence of bizarre giant cells with pycnotic nuclei, which are not present in fibrosarcomas. He personally told this author that one of the reasons these tumors are frequently called fibrosarcomas by pathologists is that all mesenchymal tumors contain fibroblasts.

Liposarcomas vary greatly in size, depending on their rate of growth. One report cites a woman who had pain in her thigh at age twenty-three, swelling being noted at age thirty-six, and a small mass was removed at age thirty-eight; recurred at age forty-four, and was again removed at age sixty. Another case in the literature records a tumor growing to an enormous size in six months, with death occurring a few months thereafter.

Clinically, in the extremities, one should remember that simple fatty tumors and lipomas are more superficial, and generally speaking, a deeper mass in the thigh or arm would lead one to be more suspicious of liposarcoma. As a rule, liposarcomas are first noted as rounded, soft or firm swellings which appear spontaneously and grow steadily. When large, pressure effects are noted.

Grossly, these tumors not only vary in size but also in firmness, as a rule being more firm than adipose tissue or lipomas. They are bulky, nodular masses. Generally, they are encapsulated until recurrences develop as diffusely infiltrating metastasizing processes. Because they can be very vascular, hemorrhage frequently occurs in them, thus varying their color from shades of lemon and yellow to red and brown. Over half of them are slimy and mucoid. On section, normal fat can appear between the definite sarcomatous areas and in some cases, fibrous areas have occurred. Liposarcomas apparently grow more commonly by direct extension than through the blood and lymph channels. In patients with more than one tumor, they have been thought to be due to independent growth. Where metastases have occurred, about 60 per cent go to the lungs and pleura and about 25 per cent to the liver, with isolated cases in the bone marrow and central nervous system. In no case in the literature has there been widespread metastases. The majority of these tumors develop deeply in the inter- and intra-muscular zones of the extremities. In this connection, Ewing calls attention to the fact that the true fascial sarcoma of Virchow is derived from fibrous tissue and does not contain fat. Liposarcomas are closely attached to blood vessels and nerve sheaths. In the latter connection, it is reported that the development of lipomas is undoubtedly affected in some fashion by the nervous system, but there exists no proof that malignant fatty tumors spring from nerve sheaths themselves. This, nevertheless, is still disputed by some.

It is interesting that there are no chemical differences between normal and neoplastic fat, and the fat in a neoplasm is not apparently available for nutritional deficiencies. There are cases of enormous fatty tumors in the literature where the host suffered from malnutrition. Microscopically, these tumors vary more than in the gross descriptions. Some feel the variety of names given make for confusion. Stout, for example, feels that a diagnosis of myxofibrosarcoma or lipomyxosarcoma is the same as liposarcoma. Ewing describes two main types:

1. Fetal or embryonal myxoliposarcoma type, presenting fetal fat cells with much myxomatous tissue and proliferating capillaries.
2. Adult liposarcoma, containing polyhedral cells and spindle cells, highly granular cells with little fat and occasional giant cells.

Stout divides liposarcomas into four groups:

1. Well differentiated—myxoid
2. Poorly differentiated—myxoid
3. Round cell and adenoid type and
4. Mixed type.

In Stout's well differentiated types, metastases seldom occurred; in his other three types, metastases did occur.

Treatment of these tumors varies. Fatty tumors are radiosensitive and some feel x-ray should be used first, followed by surgical resection if necessary. Stout feels a diagnosis should and can, in most cases, be made by a needle biopsy before any surgery is attempted. Early simple removal is often carried out, only to be frequently followed by more malignant recurrences and a high mortality rate. This sequence is frequent in the literature. Surgical removal because of pressure symptoms is sometimes required, this being the situation in the case I wish to report. Finally, amputation must seriously be considered.

Case Report

Mrs. C. H. first came to my attention in 1951, when she was fifty-seven years of age. In 1950 she was hospitalized for coronary sclerosis. In 1951 I was asked to see her because of a large tumor in her left thigh. Her history was to the effect that she had had the tumor for nine years and some five years ago her doctor did not think she should have it removed because of hardening of the arteries. The tumor began to increase in size and caused her some pressure symptoms in the leg. In 1951 an x-ray of her chest revealed two small nodules in the right fourth anterior interspace, which were thought to represent either metastases or possibly an old tubercular deposit. An x-ray of the mass in the leg was thought by the roentgenologist to be either a lipomatous or myxomatous type of tumor. The leg x-rays showed there was same calcification of the larger vessels, but whether this was in the tumor or extrinsic to it could not be ascertained. The x-rays also showed displacement of the thigh muscles by the tumor but there was no evidence of bone involvement.

I removed this tumor through a posteromedial incision, the tumor extending from her knee to her hip. The tumor followed the fascial planes going between and displacing muscles, and had to be separated from the vessels and nerves in the leg. All the tumor was removed.

The specimen consisted of a soft, fatty tumor, with scattered firm areas; the overall tumor appeared encapsulated and weighed about 3750 gms. It measured 35 x 35 x 18 cms. On cut section mucoid material was seen. The color varied from yellow to brown. About eighteen sections were made from this tumor: No cellular detail could be identified in some because of necrosis; in others the picture was composed of pleomorphic and polymorphous cells, with the formation of some collagenous fibrous tissue. In some places considerable fat and some mucin were seen, thus accounting for the myxomatous or fatty appearance. There were numerous multinucleated cells; the nuclei were hyperchromatic and in many places the nucleoli were prominent. Mitoses were seen, but not too frequently. There was no evidence of this being a rhabdomyosarcoma. The tumor was interpreted by the pathologist as lipoma myxomatodes. Radical surgery was suggested by the pathologist.

Two days after the operation, the patient had another attack of pain in her chest which her internist regarded as cardiac in origin, and it was thought best not to consider amputation.

Late in 1952, she entered the hospital again with a diagnosis of hypertension, coronary thrombosis, auricular fibrillation and myocardial insufficiency. Early in her admission I saw her and could find no clinical evidence of recurrence. She died without an autopsy.

Subsequently in a personal interview with Dr. Stout, he repeated that in his experience, liposarcoma, next to fibrosarcoma, is the most common of the malignant

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sarcomas. At that time he felt that the lower extremity is the most common site for the development of liposarcomas. He distinguished them from fibrosarcomas by bizarre giant cells, single or multinucleated, which in liposarcoma have clumps of pycnotic material in the nucleus, which are in the process of degeneration.

Liposarcomas differ from true myxomas in the fact that the former usually has a vascular pattern similar in appearance to the vascular pattern of embryonal fat. Also, the stellate cells in a myxoma do not have vacuoles in their branched areas which contain droplets of lipid, as is the case in liposarcomas.

In conclusion:

1. Liposarcomas are quite common in the thigh.
2. They can in many cases be diagnosed by needle biopsy.
3. Simple removal is not infrequently followed by recurrences.
4. Radical amputation should be considered.

Discussion

DR. F. E. B. FOLEY, Saint Paul: Several years ago at the Ancker Hospital I encountered a tumor of this sort which gave very bizarre urologic findings. The woman

had what appeared to be a very large left kidney. A shadowgraph catheter introduced into the left ureter and kidney pelvis crossed the midline above the sacrum and its tip lay in the region of the right kidney. Bilateral pyelograms showed both kidney pelvis in the right renal region and somewhat overlapping each other. The appearance was that of unilateral fused kidney with crossed dystopia of the left renal mass, but was not typical of that condition.

At operation through the left flank, an enormous fibrolipomatous mass was found lying against the muscles of the renal fossa. The front of the mass, covered by peritoneum, extended over to the right kidney and had carried the left kidney before it placing the anterior surface of the left kidney against the anterior surface of the right kidney.

The fibrolipomatous mass was readily shelled out and separated from the left kidney which was returned to normal position.

Within a year there was a recurrent mass almost as large as the original. This, too, was readily removed. Again there was recurrence and the woman died within a year following the second operation.

The meeting was adjourned.

ROBERT E. PRIEST, M.D., *Secretary*

Meeting of May 13, 1953

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 13, 1953. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p.m. by the President, Dr. E. A. Regnier.

There were forty-six members and five guests present.

Minutes of the April meeting were read and approved.

The guest speaker of the evening was Dr. Richard R. Trail, Medical Director of Papworth Community (Tuber-

culosis Rehabilitation Center), England.

The President asked Dr. John Briggs to introduce Dr. Trail who spoke on medical conditions in England.

Dr. Martin Nordland, Minneapolis, read a paper on "Diagnostic Difficulty in Surgical Lesions of the Small Intestine." This was illustrated with lantern slides.

The meeting was adjourned.

ROBERT E. PRIEST, M.D., *Secretary*

MEDICAL ECONOMICS

(Continued from Page 467)

their own feet financially." He further said that Blue Shield plans are "underwritten and hence, in fact, reinsured by the physicians who sponsor them."

The above account of the unusual alignments of sentiments on this issue, shows conclusively that groups known to be widely divergent, get together with similar views on a subject, but for

entirely separate reasons. It also shows that matters of health are not only of concern to differently-motivated groups, but that matters of health often hinge on political and business considerations. Playing politics and business games with such matters can be dangerous, especially when the lives and welfare of an entire population can be affected by it.

◆ Reports and Announcements ◆

HOWARD W. BLAKESLEE AWARD

The American Heart Association has announced that the Howard W. Blakeslee Award for outstanding scientific reporting in the field of heart and blood vessel diseases will be divided into several awards to cover specific categories of newspapers, magazines, radio and television, instead of the single award established last year.

The 1954 Awards have been deferred until the combined meeting of the Second World Congress of Cardiology and the Twenty-Seventh Scientific Sessions of the American Heart Association to be held September 12-17 in Washington, D.C. The Blakeslee Award originally was scheduled for presentation at the Association's annual meeting in the spring.

The Awards will provide a minimum of \$500 for each category to be selected by the judges rather than the original single honorarium of \$1,000.

The Blakeslee Award was established last year in memory of Howard W. Blakeslee, the late science editor of the Associated Press and founder of the National Association of Science Writers, who died of heart disease. It is awarded annually to individuals whose creative efforts in any medium of mass communication are judged to have contributed most to public understanding of heart and circulatory diseases.

AMERICAN ASSOCIATION OF BLOOD BANKS

The Seventh Annual Meeting of the American Association of Blood Banks will be held at the Shoreham Hotel in Washington, D.C. from September 13-15, 1954. There will be another excellent scientific program, interesting exhibits, a special course for technologists and round-table and panel discussions led by national and international authorities. For further information write to the Office of the Secretary, American Association of Blood Banks, 3500 Gaston Avenue, Dallas, Texas.

COURSE IN POSTGRADUATE GASTROENTEROLOGY

The National Gastroenterological Association announces that its Sixth Annual Course in Postgraduate Gastroenterology will be given at The Shoreham in Washington, D.C. on October 28, 29, 30, 1954. The course will again be under the direction of co-chairmanship of Dr. Owen H. Wangenstein, Professor of Surgery of the University of Minnesota Medical School, who will serve as surgical co-ordinator and Dr. I. Snapper, Director of Medical Education, Bethel Hospital, Brooklyn, N. Y., who will serve as medical co-ordinator. Drs. Wangenstein and Snapper will be assisted by a distinguished faculty selected from the medical schools and Walter Reed Army Hospital, whose presentations will cover all phases of gastrointestinal diseases and

problems. The entire session on Friday, October 30, 1954, will be given at the Walter Reed Army Hospital. For further information and enrollment write to the National Gastroenterological Association, Department GSJ, 33 West 60th Street, New York 23, N. Y.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The Minnesota Society of Neurology and Psychiatry held their May meeting at St. Mary's Hospital in Rochester. Surgical clinics were held in the operating rooms at 8:00 A.M. The subject for the morning program was "Neurologic Manifestations of Some Collagen Diseases." Those participating were Dr. A. A. Bailey, Dr. L. M. Eaton, Dr. E. H. Lambert, Dr. C. H. Millikan and Dr. R. M. Shick. In the afternoon Dr. N. W. Barker spoke on "Bird Photography and Time-Lapse Photography."

AMERICAN OCCUPATIONAL THERAPY ASSOCIATION

The 37th Annual Conference of the American Occupational Therapy Association will be held at the Shoreham Hotel, Washington, D. C., October 16-22, 1954. The meetings will be as follows:

- October 16-17 Preliminary Meetings
- October 18-19 Institute—Interpersonal Relations
- October 20-22 General Conference—Theme:
"Capitalize Your Assets"

COURSE IN CARDIOVASCULAR DISEASES

A course in "Newer Developments in Cardiovascular Diseases" will be given at The Mount Sinai Hospital, New York, October 11 through 15, 1954, under the auspices of the American College of Physicians. As the title implies, the recent advances will be stressed. Dr. Arthur M. Master and Dr. Charles K. Friedberg will direct the course, and prominent cardiologists and cardiac surgeons will participate.

INTER-SOCIETY CYTOLOGY COUNCIL

The second annual meeting of the Inter-Society Cytology Council will be held in Boston, Friday and Saturday, November 12 and 13, 1954. Those having material to present are invited to submit three copies of the title and an informative abstract of not more than 200 words to Dr. John B. Graham, Chairman of the Program Committee, 32 Fruit Street, Boston, Massachusetts, before July 15, 1954. Abstracts of all papers accepted will be published in the official program.

In Memoriam

THOMAS LLOYD DAVIS

Dr. Thomas Lloyd Davis II, of Wadena died as a result of an automobile accident, April 27, near Paynesville. He was thirty-two years old.

The accident occurred while Dr. Davis was returning home from a Phi Chi fraternity banquet in Minneapolis. He was alone in the car at the time.

Dr. Davis was the son and grandson of physicians. Two cousins are practicing physicians and a brother, William, is a senior medical student at the University of Colorado. He practiced with his father, Dr. Thomas L. Davis and his cousin Dr. Luther F. Davis in the Davis Clinic at Wadena.

He was born at Wadena and received his education at Macalester College and the University of Minnesota Medical School. He served his internship at Hurley Hospital, Flint, Michigan, and, after a year of practice at Wadena, took postgraduate training in eye, ear, nose and throat work in Chicago and, later, in Portland, Maine. In 1949, he spent several months in eye surgery at the Patna Mission, near Calcutta, India. He returned to practice with the Davis Clinic in 1950. He was a member of the Upper Mississippi Medical Society and of the Minnesota State Medical Association and the American Medical Association.

Surviving are his wife, the former Geraldine Fryklund; three children, Bonnie (9), an adopted daughter whose father was killed on Okinawa; Thomas (4), Richard (3), Jeremy, seven months; his mother and father, Dr. and Mrs. Thomas L. Davis; his brother, William, Denver; two sisters, Mrs. Denise Ferron, Honolulu, and Mrs. Judy Oehler, Aberdeen, and his cousin and associate, Dr. Luther F. Davis.

FRED C. GROVER

Dr. Fred C. Grover, veteran West Duluth physician, died March 19, 1954, at the age of seventy-nine in Duluth.

Dr. Grover was born at Olathea, Kansas, and established himself in practice in West Duluth in 1912. He received his medical education at Hamline University and at a medical college in Kalamazoo, Michigan. He was a former member of the St. Louis County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Surviving are his wife, Artense C.; a son, Rev. Eugene F. Grover, Beardsley, Minnesota; two daughters, Mrs. Melvin E. Bloomquist and Mrs. Bonnie Carlson, both of Duluth; two brothers, William R. Grover, Detroit, and Dr. Jerry G. Grover, Chicago; two sisters, Miss Mildred E. Grover, Chicago, and Mrs. Ed Carter, St. Petersburg, Florida, and eight grandchildren.

GLENN ROBERT MATCHAN

Dr. Glenn Robert Matchan, seventy-seven, died March 27, 1954, in St. Cloud.

Dr. Matchan was a former Minneapolis city health inspector. After a number of years in general practice

and eight years with the health department, he joined the staff of the University of Minnesota Medical School to teach pediatrics. He retired because of illness twenty-three years ago and had been a patient at the Veterans Hospital in St. Cloud for the past three years.

Dr. Matchan was an affiliate member of the the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors are a son, George R., Minneapolis, former state legislator; a daughter, Mrs. Frances M. Carter, Saint Paul, a sister, Mrs. Grace Schroder, Minneapolis, and three grandchildren.

ARTHUR E. STOECKMANN

Dr. Arthur E. Stoeckmann, fifty-three, died after an extended illness in the Community Hospital at St. Peter, April 30, 1954.

He had been a member of the St. Peter State Hospital staff since 1944, and had been associated with the Earl Clinic in Saint Paul from 1929 to 1940.

Dr. Stoeckmann was born at Sheboygan, Wisconsin, and was graduated in medicine from the University of Minnesota medical school. He served his internship at Minneapolis General Hospital and took nine years postgraduate training in surgery and psychiatry at Mounds Park Hospital in Saint Paul. He was a member of the Nicollet-Le Sueur County Medical Society, the Minnesota State Medical Association and the American Medical Association.

JOSEPH J. STRATTE

Dr. Joseph J. Stratte, formerly of Hallock, died suddenly in Minneapolis, April 9, while attending a continuation study course on urology at the Center for Continuation Study on the University campus. He was sixty-seven years old.

Dr. Stratte had practiced in Grand Forks, North Dakota, since 1932. He was born in Dawson, Minnesota, received his medical education at the University of Minnesota and served his internship at the University Hospital. He became assistant to the chief of surgery at the University in 1918 and opened his practice in Hallock in 1922. He remained a staff member at the Kittson Memorial Hospital at Hallock and he had just completed a term as chief of surgery at Deaconess Hospital in Grand Forks.

He was a member of the Minnesota State Medical Association until 1932, when he transferred his membership to the Grand Forks District Medical Society and the North Dakota State Medical Association. He was also a member of the North Dakota-Manitoba Urological Society.

Survivors include his wife, the former Irene Dille; four children by an earlier marriage, Dr. John Stratte, Enumclaw, Washington; Dr. Paul Stratte, Redding, California; Mrs. B. M. Griffin, Mauston, Wisconsin, and Mrs. E. L. Billing, San Francisco; a brother, Henry Stratte, Dawson; a sister, Mina Stratte, Glendale, California, and ten grandchildren.

◆ Of General Interest ◆

Drs. C. L. Haney and Cyril M. Smith were honored at a dinner of the Northern Pacific Veterans' Association on April 12. They have been medical examiners for the Northern Pacific for more than thirty years.

* * *

Dr. George R. McNear, Jr., has joined the staff of the Mankato Clinic. He recently returned from England where he had served as chief of obstetrics and gynecology at a United States air force hospital for three years. A native of Boston, he earned his doctor of medicine degree at Cornell university medical college in 1947. He was an intern at New York Lying-In hospital and was assistant resident obstetrician and gynecologist at the same hospital for the next year. He was chief resident obstetrician and gynecologist at New York city hospital from 1949 until his call to active duty with the air force in 1951.

The medical staff of Winona General Hospital has named **Dr. E. E. Christensen** as president, succeeding **Dr. P. A. Mattison**. **Dr. L. I. Younger** has been re-elected vice president.

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Dr. Harold Elliot, Hayfield, former medical missionary to Africa, spoke to the members of the Community Covenant Church of Taopi, on Sunday, April 11. In addition to his speech, he showed slides illustrating his work in Africa.

* * *

Dr. and Mrs. E. H. Wood left April 18 for a visit to Mexico. Dr. Wood participated in the program celebrating the tenth anniversary of the foundation of the National Institute of Cardiology in Mexico City. Also in Mexico City he gave a lecture at a meeting of the National Academy of Medicine. In Acapulco he addressed the Second Congress of the Society of Internes and Residents of the Institute of Cardiology and presides at a meeting of the section of hemodynamica and physiology of the society. They returned home about May 1.

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Dr. Lewis J. Glynn, Jr., Saint Paul, was the guest speaker at the April meeting of the Bethlehem Academy Parent-Teacher Association. He explained the purpose of psychiatry, emphasizing the importance of competent psychiatric help in some cases.

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Dr. C. W. Rogers, pediatrician of the Winona General Hospital, was the principal speaker at the meeting of the American Legion Auxiliary on April 13. Dr. Rogers supplemented his talk with motion pictures.

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Dr. F. M. McCarten and Mrs. McCarten returned April 9 from Chicago, where they attended the three-

day meeting of the American Association of Railway Surgeons.

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Dr. Paul A. O'Leary, senior consultant in the section of dermatology at the Mayo Clinic, has been honored by a group of former fellows in the Mayo Foundation who received training under him. In the March issue of the *Journal of Investigative Dermatology*, eleven scientific papers written by the former fellows appear. These have been dedicated to Dr. O'Leary. The foreword was written by his colleague, **Dr. Louis Brunsting**, present head of the dermatology section. "The occasion renders tribute to one whose professional acumen and educational talent have combined to dignify and enhance the stature of our specialty in his generation," Dr. Brunsting wrote. "Dr. O'Leary's career refutes the assumption that dermatology is a superficial specialty. Long association with expert medical colleagues in group practice has made him a clinician, first and foremost. His concern has always been with the patient as a whole."

* * *

Thirteen Mayo Clinic physicians attended meetings of the Federation of American societies for Experimental Biology at Atlantic City, New Jersey, in April. Those attending were: **Drs. E. J. Baldes, J. L. Bollman, H. E. Essex, E. V. Flock, W. S. Fowler, H. F. Helmholtz, Jr., F. D. Mann, H. L. Mason, V. R. Mattox, M. H. Power, G. M. Roth, K. G. Wakim and E. H. Wood**. Speaking before the various societies were Drs. Bollman, Flock, Fowler, Helmholtz, Mann, Mattox, Wakim and Wood. Dr. Essex is president-elect of the American Physiological society.

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Dr. S. Shirai, Coleraine, gave a talk on personal health for the Woman's Club of Coleraine at their meeting in April.

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Dr. and Mrs. H. P. Linner, Minneapolis, have recently returned from a cruise around South America which included a visit to the most southern city of the world, Punta Arenas, on the Strait of Magellan. The Linnerns were away two months aboard the Swedish luxury liner, *New Kingsholm*. Highlights of the sunshine circle were Buenos Aires, Argentina, and Rio de Janeiro, Brazil.

* * *

Dr. and Mrs. Owen Robbins, Minneapolis, recently returned from a six weeks' business and pleasure trip to the Far East. They visited Japan, Formosa, Hong Kong, Philippine Islands, Thailand and Hawaii. While in Manila, Dr. Robbins delivered a paper to the Society of Obstetricians and Gynecologists and to a medical procurement group.

OF GENERAL INTEREST

Dr. H. N. Sutherland, who recently sold his interest in the Shipman hospital, was honored at a dinner in April. **Dr. and Mrs. Jack P. Grahek** were host and hostess for the affair which was attended by thirty-one employes of the hospital. Dr. Sutherland was presented with a gift from the hospital employes.

Dr. John Carroll, formerly of Montevideo, has established a medical practice in Winsted. Winsted has been without a doctor for more than a year.

Dr. Charles W. Mayo addressed the Mower County Education Association in April. He also was the principal speaker at the April meeting of the Kenyon Parent-Teacher association.

Dr. William Kosiak, chief of staff of the Two Harbors Community hospital, addressed a meeting of the Saturday Lunch club of Duluth in April. He discussed "The Group Health Program vs. Socialized Medicine." His talk was followed by a question-and-answer period.

Dr. E. J. Tanquist, Alexandria, attended the sixth annual session of the International Academy of Proctology and abdominal surgery in Chicago. Dr. Tanquist is a Fellow in this organization.

Dr. B. J. Cronwell, Austin, attended two medical conventions in Chicago. The American Heart meeting and the American College of Physicians.

Two Mayo Clinic staff men, **Drs. Louis A. Brunsting** and **Paul A. O'Leary**, of the section of dermatology, attended the seventy-fourth annual scientific session of the American Dermatological association in White Sulphur Springs, West Virginia. Dr. Brunsting, president of the association, gave the presidential address on "Observations on Porphyria Cutaneo Tarda." Dr. O'Leary participated in discussions and attended a meeting of the honorary and corresponding memberships committee of which he is chairman.

Dr. Robert Rosenthal, Chief of Staff, Childrens Hospital, Inc., addressed the Annual Meeting of the Childrens Hospital Association on April 26. His subject was "The Child in Ancient Egypt."

Dr. John Raihala, Virginia, has been hospitalized in the University Hospital, Minneapolis.

Dr. J. A. Myers, professor of medicine and public health at the University of Minnesota, addressed the annual meetings of the North Dakota and Iowa Tuberculosis and Health associations in April.

Dr. Neil Lidenberg, Saint Paul, has invented a small plastic device that will help break the thumb sucking habit of infants and small children. It was developed by Dr. Lidenberg as a hobby, but his invention interested manufacturers. A temporary factory now is in

operation in Minneapolis and plans are being completed for a plant to be located in Saint Paul.

Dr. Richard Bardon, Duluth, addressed the St. Louis County Medical society on April 8. His topic was the history and traditions of the society.

Dr. and Mrs. E. W. Arnold, Adrian, returned home on April 16, from a six weeks' vacation trip to Tallahassee and Miami, Florida. On their return home they stopped in Chicago where they attended the American Association of Railroad Surgeons' annual meeting. They report a very enjoyable trip, but were satisfied to be at home again.

Dr. Joseph B. Gaida, St. Cloud, has been elected second vice-president of the Minnesota Academy of Ophthalmology and Otolaryngology for the coming year.

Three Mayo Clinic staff men participated in special programs in New York, Wisconsin and Canada in April. **Dr. Philip Hench** addressed a meeting of the Buffalo Academy of Medicine in Buffalo, New York. His subject was "The Use of Cortisones and Corticotropins in General Medicine." **Dr. T. J. Dry** participated in a Wisconsin teaching program at Eau Claire, Stevens Point and Appleton. At each meeting he presented a paper on "Cardiac Diseases Which Might Be Amenable to Surgical Treatment." **Dr. W. H. ReMine** participated in a postgraduate refresher course at the University of Manitoba in Winnipeg, Canada. He presented two papers at the course and also participated in a panel discussion on preoperative and postoperative care.

Dr. H. F. Helmholz, Rochester, vice president of the Minnesota Congress of Parents and Teachers, was guest speaker at the meeting of the Lincoln P.T.A. in Faribault on April 20. Dr. Helmholz had as his subject "The Drug Menace." Dr. Helmholz has had many years of P.T.A. work and has served on the State Board of Managers as Exceptional Child chairman.

Dr. Frank J. Carthey and Georgia Roberts were united in marriage at the St. Peter's Episcopal Church in New Ulm on April 12. Following their honeymoon in the Black Hills and in Northern Minnesota, Dr. and Mrs. Carthey returned to New Ulm where Dr. Carthey is associated with the Seifert clinic.

Dr. W. S. Neff, Virginia, spent a week in Detroit, Michigan, where he participated in a course in clinical electrocardiography of the American College of Physicians.

Dr. and Mrs. Joseph Janes left Rochester April 19 for New York where they sailed on a two-month trip to Europe aboard *The Britannic*. They were

OF GENERAL INTEREST

accompanied by Mrs. Janes' sister, Miss Sadie Johnson, Atlanta, Georgia. They first visited England where Dr. Janes remained to visit friends and to observe at medical institutions there and in Scotland. Mrs. Janes and her sister toured the continent. They visited in Norway, where they visited relatives, Denmark, Italy, Switzerland, France and Scotland. Dr. and Mrs. Janes sailed for home aboard the Queen Mary and are expected back in Rochester about June 24.

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Dr. Norman Hoover, of the East Range Clinic, Virginia, gave a talk entitled "Health" at the April meeting of the Mountain Iron Parent-Teacher Association.

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Dr. John Damion Krafchuk and Markell Brooks were married April 19 at the Unity Church in Saint Paul. Dr. Krafchuk has been on the staff of the University of Minnesota hospitals.

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Dr. Claude Hitchcock, director of the cancer detection center which is a part of the University of Minnesota, spoke at the second clinical conference held for the medical staff at the city hospital in Montevideo in April. Sponsors of the clinical conferences in addition to the medical staff at the Montevideo hospital were the Minnesota Department of Health, University of Minnesota, Minnesota Medical association, Minnesota Heart association and the Minnesota Cancer Society.

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Dr. Richard W. Anderson, associate professor of psychiatry and neurology at the University of Minnesota and director of psychiatric services at Minneapolis General hospital, spoke on "Family Planning for Emotional Maturity" at the annual meeting of the Ramsey County League for Planned Parenthood.

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Dr. Rolland A. Olson has joined the staff of the Martinson Clinic in Wayzata. Dr. Olson was born in Mankato, he graduated from Maplewood Academy in Hutchinson, following which he took his pre-medical course at Union College, Lincoln, Nebraska. Following graduation from the College of Medical Evangelists School of Medicine in 1945, he served an internship at the Portland Sanitorium and hospital, Portland, Oregon. He served nineteen months in the army, most of which were in Japan. After discharge, he interned six more months, followed by a three year fellowship in internal medicine at the Los Angeles County General Hospital, Los Angeles, California. After a seventeen-month period of private practice, he was recalled into the army. He served in the capacity of chief of the medical service at the Fort Lawton Army hospital, Seattle, Washington, until he received his discharge in March.

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Dr. Allen Hodges of the Mental Health clinic, Albert Lea, was guest speaker when the Business and Professional Women of Albert Lea met on April 14.

JUNE, 1954

Dr. Hodges traced the beginning of the mental health program in the state and explained his work with the local clinic.

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Dr. Rudolph Koucky, Minneapolis pathologist, spoke at a regular meeting of the Southwestern Minnesota Medical Society on April 19. Doctors from a six-county area attended.

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Dr. and Mrs. Waltman Walters and son James, left Rochester April 17, on a six weeks' trip to Europe. They sailed from New York on the SS Constitution. After docking at Naples, they toured Italy and Switzerland before going to England where Dr. Walters attended surgical meetings. He was guest of the Association of Surgeons of Great Britain and Ireland at Leeds, at which time **Drs. John Waugh** and **S. W. Harrington**, also of Rochester, presented papers. At the London meeting of the American College of Surgeons, May 17-19, Dr. Walters presided at a luncheon at which a panel discussion was held on "Intestinal Obstructions" in which Dr. Waugh also participated. Dr. Walters was on a panel discussing "Massive Gastrointestinal Hemorrhages." On May 20, Dr. Walters attended a reception of the International Society of Surgery in Paris and he attended operative clinics in different hospitals in Paris May 21 and 22. The Walters family visited briefly on the Riviera before flying from Paris to the United States on June 2.

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Dr. and Mrs. D. E. Dille and **Dr. and Mrs. C. A. Wilmot**, Litchfield, drove to Cleveland, Ohio, to attend the National Medical Convention of the American Academy of General Practitioners which met March 22 thru 25. The doctors attended scientific sessions of lectures on all the latest medical works. One of the outstanding parts of the program was a lecture by Sir Alexander Flemming.

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Dr. Francis Stutzman is now located at the Variety Club Heart Hospital, Minneapolis, following his discharge from service. Dr. Stutzman was stationed in Bremerhaven, Germany, and while there, he and his family were fortunate in being able to tour Europe.

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Dr. S. L. Elliott, Osakis, was able to resume his practice about May 1 following plastic surgery on his fingers due to old x-ray burns. The plastic surgery was done in Miller hospital in Saint Paul.

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The Minnesota Heart association has begun a survey on the relation of heart disease to employment problems. **Dr. Karl W. Anderson**, medical director of Northwestern National Life Insurance Company and chairman of the association's "Cardiac-in-Industry" committee, said the co-operation of 100 Twin Cities commercial and industrial firms has been solicited. The survey ends June 30. **Dr. L. G. Reeder**, research associate in industrial sociology at the University of Minnesota, is directing the survey.

OF GENERAL INTEREST

Dr. Harold J. Walder, Duluth urologist, indorsed a message of hope of the American Cancer society in his report on cancer involvement in prostate gland surgery in the Duluth area. Speaker at the Duluth Rotary club meeting, Dr. Walder told members that hormone treatment developed at the Mayo Clinic, improvement in surgery techniques and treatment of and general increase in public knowledge about cancer have contributed to the decline of what was almost a certain killer at the turn of the century.

* * *

Dr. Roy G. Holly, Associate Professor of the Department of Obstetrics and Gynecology at the University of Minnesota, was in charge of a clinical session at the St. Francis Hospital, Breckenridge, on May 6. These clinical sessions are sponsored by the Minnesota Department of Health, the University of Minnesota School of Medicine, the Minnesota Medical Association, the Minnesota Division of the American Cancer Society, and the Minnesota Heart Association.

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Dr. Merrill D. Chesler, Minneapolis, was certified by the American Board of Plastic Surgery, by examinations held at Galveston, Texas, April 17-19, 1954. Following the examinations he attended the meeting of The American Association of Plastic Surgeons held at the University of Texas Medical School at Galveston, April 21-23.

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Dr. W. R. Brooksher, Editor of the *Journal of The Arkansas Medical Society* for the past twenty years, has resigned from his position.

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Dr. M. K. Beebe, formerly of 1512 Brook Avenue, S.E., Minneapolis, has announced that he will retire from active practice.

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Dr. Cyril Smith, Duluth, was appointed by Governor C. Elmer Anderson to another term on the state athletic commission.

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Value of America's free medical system was stressed by **Dr. Maurice Meller**, Brainerd, at a meeting of the Lions club. Dr. Meller praised America's medical freedom after telling of his experiences in Poland, Czechoslovakia, Italy and Shanghai. Before he left Poland in pre-war days, he said, socialistic institutions were creeping into the country and medical practice was being regimented. Each patient could be allowed only a couple of minutes per call, which resulted in inefficient diagnosis and treatment. The same socialization was occurring in Czechoslovakia and Italy. This led him to go to Shanghai in 1939. Medicine was comparatively free from interference upon his arrival there, but after the Japanese came, socialization of medicine developed, resulting in poor treatment again. Since his arrival in America, Dr. Meller said, he has discovered what a really free medical practice can accomplish for the health of a nation.

Dr. Carl O. Kohlbry, Duluth, spoke on "Polio-myelitis" for the Duluth Business and Professional Women's club, April 13.

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Dr. Byrl J. Kennedy, Assistant Professor in the Department of Medicine, University Hospital, Minneapolis, spoke at the first of two clinical conferences on April 12, at the Hibbing General Hospital. Dr. Kennedy presented case histories of cancer patients, emphasizing the use of hormones in the treatment of breast cancer. He also reviewed recent trends in diagnosis and treatment in the field of cancer.

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Dr. B. F. Van Valkenburg, Long Prairie, observed his ninetieth birthday on April 30. An open house was held at his home from 3 to 5 p.m.

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Dr. and Mrs. E. C. Bayley, Lake City, returned in April from a combined business and vacation trip. They first went to New York where they boarded the *S.S. Patricia* for a West Indies cruise. The cruise included visits to the ports of Port Au Prince, Haiti; Kingston, Jamaica; a port in Colombia, South America; Panama and Havana, Cuba. After landing in New York they spent a week there attending the National Blue Cross and Blue Shield Convention.

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Dr. R. V. Williams was awarded a fifty-year certificate and life membership in the Rushford Commercial Club held in May. He was honored for his fifty years of service to the community. He went to Rushford in 1904. He is a member emeritus of the Minnesota Medical Association and a member and past president of the Southern Minnesota Medical Association.

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Dr. F. R. Kotchevar, Eveleth, president of the East Range Clinic, left May 1 on a month and a half trip to Europe, where he and other members of the American College of Surgeons attended meetings concerning surgery and medicine. The American physicians held a get-together at the Statler hotel in New York on May 4, the day before they sailed. They arrived in Southampton, England, on May 8, then traveled thru Scotland, England, France, Germany, Switzerland and Holland. The trip was sponsored by the Association of British and American Surgeons.

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Dr. Theodore Rasmussen, a former fellow in the Mayo Foundation and brother of Dr. W. C. Rasmussen of the Mayo Clinic, recently was appointed professor of neurology and neurosurgery at the Montreal Neurological Institute at McGill University, Montreal, Canada. Dr. Rasmussen was a fellow in neurology in the Mayo Foundation from 1936-1939, and since 1947 had been professor of neurologic surgery at the University of Chicago and head of the division of neurologic surgery at the University of Chicago clinics.

OF GENERAL INTEREST

Two additional doctors have joined the staff of the state hospital at Fergus Falls. **Dr. Samuel McDaniel**, formerly from Brunswick, Georgia, and **Dr. Harry C. Browne**, formerly from the Sandstone State hospital. Dr. McDaniel previously practiced medicine in Virginia for nine years. Dr. Browne received a fellowship in internal medicine with the Mayo foundation in 1937. In 1941 he entered the army but stayed at Rochester teaching fellows going into service until 1948.

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Dr. Arnold Robbins, formerly of Flushing, New York, arrived in Heron Lake in April to join the practice of Dr. Richard W. Nicholson at the local hospital. Dr. Robbins was recently discharged from the service where he was staff surgeon; he worked both in Alaska and Korea. Dr. Robbins and Dr. Nicholson were associated in practice while in the army when both were in Alaska.

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The athletic department of the Butterfield school received a very fine gift from **Dr. A. D. Matson** of St. James. The gift was a whirlpool bath device.

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The medical staff of Mt. Sinai hospital presented a portrait of **Dr. Moses Barron**, first chief of staff, to the hospital in ceremonies May 2. The portrait was painted by Cameron Booth. Dr. Barron began his medical career in 1912 when he was named an instructor in pathology at the University of Minnesota.

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Dr. Richard Johnson, Saint Paul orthopedic surgeon, was the keynote speaker at the first annual meeting of United Cerebral Palsy of Minnesota on May 3, in Minneapolis.

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Dr. Howard Gray, Mayo Clinic surgeon, delivered three Sommer Memorial lectures at the Oregon Medical School Alumni association meeting in Portland in April.

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About thirty-five managers of state medical clinics and members of the Mayo Clinic's administrative staff attended the fifth annual Minnesota Clinic Managers' conference in Rochester in April. Speakers were **Dr. Samuel F. Haines**, G. Slade Schuster, J. W. Harwick, Harry A. Blackmun, Ernest H. Schlitgus, Robert C. Roesler, **Dr. Victor Johnson** and **Dr. Charles F. Code**, all of Rochester.

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Appointment of **Dr. Harold Joffe**, Virginia, as pathologist at Falls Memorial hospital has been announced by the directors of the hospital. Dr. Joffe also has been named to the hospital medical staff. He is pathologist at the Virginia Municipal Hospital and will be at the Falls hospital two days each month to consult with members of the staff and also will conduct pathological conferences. He will be available at other times on call for consultation.

Albert Lea sponsored a very successful orthopedic clinic in April. Children with post-polio, scoliosis, congenital absence of bones and Perthes disease attended. Clinicians were **Dr. Edward H. Juers**, orthopedic surgeon, and **Dr. George Kimmel**, pediatrician. Both are from Red Wing.

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Dr. Hamilton Montgomery, Rochester, received an award from Governor C. Elmer Anderson at the Minnesota Safety council's award presentation dinner, May 12. Dr. Montgomery has been active in safety work in Minnesota for many years.

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Dr. Daniel J. Moos, Minneapolis, attended the seventy-eighth Annual Session of the Arkansas State Medical Society at Fort Smith, Arkansas, on April 19, where he presented a paper entitled "Intestinal Obstruction." In the afternoon meeting he conducted a forum on "Fluid Balance in Relation to the Surgical Patient."

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The appointment of **Dr. Arnold J. Kremen**, Minneapolis surgeon, as chief of the surgical service in the Francis Delafield cancer hospital in New York City and professor of surgery in the Columbia university College of Physicians and Surgeons, effective July 1, has been announced.

Dr. Kremen joined the University staff as an instructor in surgery in July, 1947, became cancer coordinator for the United States Public Health Service at the University's medical school in 1948. He has been an associate professor of surgery since 1950. Since 1951, he has served as director of the University's surgical service at Mt. Sinai hospital, which is affiliated with the University's medical school.

In his new post, Dr. Kremen also will serve as attending surgeon at Presbyterian hospital in New York City. Both the Delafield and Presbyterian hospitals are units of the Columbia-Presbyterian Medical Center.

Author of many publications on subjects pertaining to surgery, Dr. Kremen is a member of the American College of Surgeons, the American Surgical Association, the American Medical Association, the Society of University Surgeons, Sigma Xi, Alpha Omega Alpha and many other organizations.

BLUE SHIELD-BLUE CROSS NEWS

Blue Shield enrollment for the first three months of 1954, according to the quarterly report, showed an increase of 19,205 participant subscribers. This gain for the first quarter of 1954, if projected over the entire year, reflects a greater increase of participant subscribers during the year 1954 than for each of the preceding two years. However, a quarter is too short a period of time, and the increase is too small to permit any positive predictions of a rate of increase greater than has been experienced during the past two years. This is consistent with a slower rate of increase of Blue Shield enrollment nationally, for the past two years as compared with previous years.

OF GENERAL INTEREST

After the first full year of operation of Blue Shield in Minnesota, that is on December 31, 1948, a total of 130,639 subscribers had been enrolled. During the following year, 1949, the total number of subscribers increased to 260,501. This represents practically 100 per cent enrollment increase during the year 1949. During the year 1950, an additional 151,232 participant subscribers were enrolled, bringing the total to 411,733. During the year 1951, 112,524 participant subscribers were added to the Blue Shield rolls, bringing the total number of subscribers at the end of the first four years of operation to 524,257. Thus, the average increase in the number of participant subscribers in Minnesota for the first four years was 131,064 per year.

From this time on, continued growth, but at a slower rate, was effected when during the year 1952, the total enrollment increased to 554,961 participant subscribers. This was a net gain of 30,704 participant subscribers. For the following year, a net gain of 54,513 subscribers was added to Blue Shield enrollment to bring the total to 609,474 for the year of 1953. This represents an average annual increase in the number of participant Blue Shield subscribers in Minnesota of 42,609 for the years 1952 and 1953, whereas the average yearly increase for the four preceding years was 131,064. Quite definitely this shows a slowing of the rate of enrollment for Minnesota Blue Shield.

This enrollment experience in Minnesota is consistent with a decrease in the rate of increase of Blue Shield enrollment nationally in the past few years. In 1950, total enrollment of Blue Shield plans in the United states showed a 35.6 per cent increase. The following year, 1951, the percentage of enrollment increase dropped to 27 per cent. Again in 1952, enrollment growth nationally fell to 16.7 per cent and last year, 1953, it amounted to 14 per cent. Thus, nationally, also, the rate of Blue Shield enrollment increase has shown a tendency to level off and become static.

It is important that Blue Shield's enrollment not only be maintained but increased as rapidly as possible if it is to serve the various purposes for which it was organized. For this reason it is encouraging that the increased enrollment for the first quarter this year might portend a slightly greater rate of growth than during the preceding two years.

Since October, 1953, Blue Cross has been represented at the various medical staff meetings in hospitals throughout the state by Victor Anderson, former superintendent of Abbott Hospital and now Hospital Consultant for Blue Cross.

Speaking at these various medical staff meetings, Mr. Anderson has presented the facts of Blue Cross. He has explained fully the benefits, the exclusions of the contract, and presented the facts relating to the high utilization experienced during 1953.

A large number of doctors throughout the state had considered that a Blue Cross contract covered practically every service rendered by a hospital. Many doctors did not realize that out-patient care for diagnostic purposes was not covered by Blue Cross and that Blue Cross rates were based on the amount of hospital service rendered to subscribers.

One of the chief questions directed at Mr. Anderson at the majority of the meetings was for a complete explanation of out-patient service. Many doctors felt that the Blue Cross contract did not go into detail enough to explain the exclusions, and it was up to the doctor to explain these to his patients.

After advising the doctors that Blue Cross was intended to be of service only to people who primarily needed hospitalized bed care and that the care of patients for purely diagnostic purposes can readily be taken care of in the doctor's offices, many doctors admitted that they had unintentionally been lax, and that they were often faulty on admitting patients who did not necessarily need hospitalized bed care. The doctors agreed after knowing the facts of Blue Cross that they would be only too willing to co-operate, and asked that Blue Cross remind them of this fact from time to time.

During the past month all doctors in the state received an open letter from Blue Cross describing a survey of 12,000 clinical case records from hospitals in the state of Michigan. This survey was conducted by the Michigan Hospital Service (Blue Cross) under the supervision of the State Medical Society Advisory Committee. This survey revealed that 18 per cent of the Blue Cross cases overstayed a total of 2,516 days as compared with 7.3 per cent of self-paying cases. This demonstrated that many patients with Blue Cross were more than two and one-half times more inclined to stay in the hospital longer than was considered necessary as compared to the patients paying their own bills.

This study also revealed that 11.7 per cent of the 12,000 cases were clinical cases in which admission apparently was made primarily for diagnostic study—where no definite treatments were received—and used 2,515 Blue Cross days care as compared to 4.4 per cent of cases in which payment was made privately which indicates that patients with Blue Cross were approximately two and one-half times more inclined to go to the hospital for diagnostic studies than patients who were paying their own bills.

Blue Cross now protects over a million Minnesotans. When protecting a third of the population of the state, it can readily be seen how any slight abuse affects the amount of benefits paid. During 1953, one out of every six persons protected by Blue Cross was hospitalized for an average of 6.5 days compared with one out of every seven staying an average of 6.2 days in 1952. This increase incidence, hospital costs and longer stay of patients during 1953 amounted to \$1,200,000. If the use of ancillary services could also be reduced just 10 per cent this would result in a substantial saving to Blue Cross of approximately an additional \$830,000 a year, and not require increased rates to a point prohibitive for those in low income brackets.

Blue Cross is rendering a very valuable service to the public, the hospitals, and the doctors. Blue Cross wants to serve more people, and it is only through the continued efforts and co-operation of the doctors that we will be able to keep Blue Cross on a voluntary basis.

During the first three months of 1954, Blue Cross hospital expense for subscribers and their dependents totaled \$4,350,600.00.